The Routledge Guidebook to

DESCARTES' MEDITATIONS

Gary Hatfield

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Descartes is widely regarded to be the father of modern philosophy and his *Meditations* is among the most important philosophical texts ever written. *The Routledge Guidebook to Descartes' Meditations* introduces the major themes in Descartes' great book and acts as a companion for reading this key work, examining:

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- The reception the book received when first seen by the world
- The relevance of Descartes' work to modern philosophy, its legacy and influence.

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To Holly, Sam, and Zoovi

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SERIES EDITOR'S PREFACE

"The past is a foreign country," wrote a British novelist, L. P. Hartley: "they do things differently there." The greatest books in the canon of the humanities and sciences can be foreign territory, too. This series is a set of excursions written by expert guides who know how to make such places become more familiar.

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The Routledge Guides to the Great Books are aimed at students in the broadest sense, not only those engaged in formal study. The intended audience of the series is all those who want to understand the books that have had the largest effects.

Anthony Gottlieb

Series editor Anthony Gottlieb is the author of *The Dream of Reason: A History of Philosophy from the Greeks to the Renaissance*.

Preface

No single text in philosophy is more widely read than Descartes' *Meditations*. Long a mainstay of the philosophical curriculum, it has served as a stalking horse for philosophers of every stripe. Although new to succeeding generations of beginning students, the work is comfortably – or, in some cases, discomfortingly – familiar to those students' teachers, and to the broader culture of letters.

This familiarity creates an interpretive barrier. Even novice readers may soon feel that they "know" what the central arguments and conclusions of the work are, where its philosophical significance and force lie. There are the skeptical challenge, the famous *cogito* in reply, the criterion of clear and distinct perception as guaranteed by a nondeceiving God, the charge of circular reasoning, the mind–body distinction, and the resulting problem of mind–body interaction.

Indeed, these elements are in the *Meditations*. Yet they are only part of the picture, vehicles to an end that, in philosophical interpretations from the middle decades of the last century, was largely overlooked: Descartes' use of the work to promote a new general science of nature (French scholarship, and earlier English-language scholarship, did attend to this factor). As Descartes

wrote to Mersenne in letters that are now frequently cited (and are quoted more fully in Ch. 1), his *Meditations* contains "all the foundations" of his physics, which "destroy" the principles of Aristotle (by yielding a radically different conception of matter and its properties, and of mind and the operation of the senses). Deeper insight can be gained into the work by remembering that its arguments and conclusions are primarily in the service of this project. Thus the skeptical doubt is put in place in order to help the reader to attain distance from the ordinary conception of nature, so that a new conception might more easily be grasped; the *cogito* is not intended to "prove" the meditator's existence (as if this were in doubt), but provides a key to the metaphysical method by which further truths can be gained; and so on.

Another feature of previous approaches to the text of the *Meditations* has dulled the senses of generations of readers, making some portions of the text virtually disappear: treatment of the text as a string of detachable arguments, embedded in some stage setting – the division into six "days" of concentrated thought – that serves as so much filler. In recent decades, some commentators have analyzed the philosophical force of the work in relation to its literary genre as a work of meditations. Descartes adapted the literary form of the spiritual exercise to his own philosophical purposes. Just as spiritual exercises involve purging the senses and intellect, receiving divine illumination, and uniting the will with God, so Descartes' cognitive exercises involve skeptically purging the cognitive faculties, achieving intellectual illumination through the "light of nature," and training the will to affirm only those metaphysical propositions that are perceived with clarity and distinctness by the intellect. When read in this way, stretches of the text that seemed to be doing no philosophical work, especially at the beginnings and endings of each Meditation, take their place in contributing to the philosophical force of this rich and compact book by guiding the reader in a process of discovery aimed at doing more than simply deriving conclusions from premises through valid arguments. The meditative process was to help the reader to discover ideas of the essences of things, ideas allegedly obscured by over-reliance on the senses.

Descartes' project to establish a new conception of nature and his choice of the meditative mode of writing are united in another aspect of the *Meditations* that deserves attention: its reliance on what Kant later called the "real use" of the intellect to establish the work's primary metaphysical conclusions. Descartes' arguments for the foundations of his physics, for his corpuscular theory of the senses, against Aristotelian "real qualities," and for the mind–body distinction share dependence on appeals to a purely intellectual conceiving of the essences of matter and mind. Descartes adopted the meditative mode of writing as a means to train readers in the proper use of their intellectual faculty. And indeed, in explaining the importance of skeptical doubt and the need to spend days or even weeks in meditation, Descartes indicated that his readers must learn to "withdraw the mind from the senses" in order to perceive the primary truths of metaphysics. (The three main points of the preceding paragraphs appeared in my "The Senses and the Fleshless Eye: The *Meditations* as Cognitive Exercises," in A. Rorty (ed.), *Essays on Descartes' Meditations*, pp. 45–79, and "Reason, Nature, and God in Descartes," in S. Voss (ed.), *Essays on the Philosophy and Science of René Descartes*, pp. 259–87.)

I have sought to weave these interpretive themes into a work that situates Descartes within his historical context without sacrificing attention to the philosophical depth of the *Meditations*. The basic context is set in Chapter 1, although more is added throughout, especially in Chapter 9 on Descartes' new science. I have aimed to provide clear statements of the major arguments and argumentative strategies of the *Meditations*, and to sketch major lines of interpretation and reconstruction, while providing my own reading. I sometimes consider alternative readings in the text, and in the References and further reading at the end of each chapter I indicate some main opposing interpretations. The basic structure of the *Meditations*, its textual strategy, and its own front matter are treated in Chapter 2. The subsequent six chapters treat each of the six Meditations in full; a topical breakdown of these Meditations may be found in the subheadings of Chapters 3–8 as listed in the table of contents. Of course, a book of this scope cannot be exhaustive, but it does offer a reading of each topical

section in every Meditation. Chapter 10 considers Descartes' legacy. The index includes notice of where special terms, such as "*a priori*," are explained.

In providing a philosophical context for Descartes, I have considered philosophical positions as they were understood and represented in his day. Thus, he engaged Aristotelian philosophy as presented by various scholastic philosophers, several of whom are named in Chapter 1. Their positions may or may not coincide with the thought of the historical Aristotle, as we would interpret him today.

My attempt throughout has been to understand Descartes' arguments and conclusions, to see where he thought they got their force, and to evaluate them in light of objections from his own time and from more recent philosophical critics, and in light of my own interpretation. It has not been possible to mention all objections, or to respond in detail to every one mentioned. In a systematic work, what comes later builds on what has come earlier; therefore, in moving through the *Meditations*, we accept some conclusions for the sake of further argument, despite the presence of unresolved objections to them (mentioned or unmentioned). The aim is not to give the impression that there are no objections or that they are not serious. Far from it. I hope that readers will evaluate the arguments as I reconstruct them, seek to develop alternative construals, and reach their own conclusions about their strengths and weaknesses.

I have aimed to make the work accessible to general readers and to students in introductory courses on the history of modern philosophy, while giving it sufficient depth to be useful in more specialized courses on Descartes or on rationalist philosophy. I also intend it to be useful and stimulating to scholars of Descartes' work and to philosophers more generally. In this connection, in addition to consolidating the meditative reading and the role of doubt in the discovery of the intellect, the work offers distinctive treatments of the *cogito* reasoning (including the discovery of mind as intellect), the Cartesian circle, the ontological argument, the argument for mind–body distinctness, and the rehabilitation of the senses in the Sixth Meditation. In this second edition, there is expanded treatment of the method of doubt and

the theory of ideas, new discussion of Descartes' theory of vision, and a more comprehensive view of Descartes' legacy. The volume title has been changed to conform to the format of the series in which the book now appears.

Anent preparation of the first edition, Michael Ayers deserves special thanks for his detailed comments. For help in thinking about revisions for this new edition and for discussion of each chapter in detail, I thank the members of the Descartes reading group at the University of Pennsylvania: Devin Curry, Louise Daoust, Nabeel Hamid, Jonathan Iwry, Jordan Taylor, Greyson Abid, and Alistair Isaac. The latter two served as research assistants in proofing revisions for accuracy and clarity. I acknowledge NSF grant 1028130 in support of Isaac's work. Daoust provided extensive and insightful written comments. Lisa Shabel offered helpful suggestions on Chapter 1. Anonymous referees for the press gave useful advice. Each chapter has been thoroughly revised and the References updated. Finally, Holly, Sam, and Zoovi have been constant companions, cheerleaders, and sources of inspiration.

ABBREVIATIONS, CITATIONS, AND TRANSLATIONS

Citations to Descartes' works follow the pagination of the modern standard edition of the original Latin and French, Charles Adam and Paul Tannery (eds.), *Oeuvres de Descartes*, rev. ed. (Paris: Vrin/CNRS, 1964–76). This edition is usually designated by "AT" plus the volume and page number. Since all citations herein are to the pagination in AT, I have dropped those initials and have given volume and page numbers only, as in (7:21) for volume 7, page 21.

I am responsible for all translations from Descartes' works. As an aid to the reader, where possible I stay close to the standard translations as listed herein. Where my version deviates on matters of substance from these, I mark the citation to AT with an asterisk (*). Where I cite AT without quoting the passage, translations usually can be found in the works listed below. The pagination of AT is shown in the margins of most translations of Descartes' works. Where there is no readily available translation for a passage that I cite and don't translate, I italicize the citation to AT.

For the major philosophical works, the standard translation is John Cottingham, Robert Stoothoff, and Dugald Murdoch (eds.),

Philosophical Writings of Descartes, 2 vols. (Cambridge: Cambridge University Press, 1984–85), usually designated as CSM. Where CSM provides only selections or no translation at all, other translations are listed below. Many of Descartes' letters have been translated by Cottingham, Stoothoff, Murdoch, and Anthony Kenny (eds.), *Philosophical Writings of Descartes: Volume 3, Correspondence* (Cambridge: Cambridge University Press, 1991), normally referred to as CSMK.

Although the context often indicates the work cited, the AT volume and page numbers can serve as a sure guide, as follows:

AT vol./page	Work
1–5	Correspondence
5:144–79	Conversation with Burman
6:1–78	*Discourse on the Method*
6:79–228	*Dioptrics* (also known as *Optics*)
6:229–366	*Meteorology* (also known as *Meteors*)
7	*Meditations*, with Objections and Replies
8A	*Principles of Philosophy*, Latin edition
8B:341–69	*Comments on a Certain Broadsheet*
9A:198–217	Note, and Letter to Clerselier, French edition, *Meditations*
9B:1–20	Author's Letter to French edition, *Principles*
10:151–69	Correspondence with Beeckman
10:213–48	Early Writings (Private Thoughts)
10:359–469	*Rules for the Direction of the Mind*
10:495–527	*The Search for Truth*
11:1–118	*The World, or Treatise on Light*
11:119–222	*Treatise on Man*
11:223–86	*Description of the Human Body*
11:301–488	*Passions of the Soul*

I cite the *Meditations* in the pagination of AT, vol. 7, the original Latin. A French translation first appeared in 1647, with Descartes' approval; in the rare case that I supplement the Latin with a qualifier found only in the French, I add the relevant AT volume number (9A) and page number. The first English translation of the *Six Metaphysical Meditations* was by William Molyneux (London: Tooke, 1680) and included the third Objections (from Hobbes) and Replies; this translation of the six Meditations

is reprinted in Stephen Gaukroger (ed.), *Blackwell Guide to Descartes' Meditations* (Malden, Mass.: Blackwell, 2006), 204–42. A full translation of the *Meditations* with Objections and Replies appears in CSM, vol. 2 (along with the *Search for Truth*). The Early Writings, *Rules*, and selections from the *Discourse* and essays, *Principles*, and *Passions* (along with other works) are in CSM, vol. 1. Elizabeth Anscombe and Peter T. Geach (eds.), *Descartes: Philosophical Writings* (Indianapolis: Bobbs-Merrill, 1971), provided a free and energetic translation (but see the note after Ch. 4) of the six Meditations (with Third Objections and Replies), along with selections from other works, without AT numbers. A literal and accurate translation of the six Meditations, with facing-page Latin, is George Heffernan (ed.), *Meditations on First Philosophy = Meditationes de prima philosophia* (Notre Dame: University of Notre Dame Press, 1990). Desmond M. Clarke has provided a fresh translation of the *Meditations* (London: Penguin, 1998), with a few selections from the Objections and Replies (and no AT numbers), as has Michael Moriarty (Oxford: Oxford University Press, 2008), with generous selections from the Objections and Replies and detailed explanatory notes.

Complete translations of *The World* and *Treatise on Man* appear in Stephen Gaukroger (ed.), *The World and Other Writings* (Cambridge: Cambridge University Press, 1998). An excellent annotated translation of the *Treatise* appears in Thomas S. Hall (ed.), *Treatise of Man* (Cambridge: Harvard University Press, 1972). The full *Meteorology* is found only in Paul J. Olscamp (ed.), *Discourse on Method, Optics, Geometry, and Meteorology* (Indianapolis: Bobbs-Merrill, 1965); this edition does not show AT numbers. For Parts 2–4 of the *Principles*, CSM offers only selections; for a complete translation, consult V. R. Miller and R. P. Miller (eds.), *Principles of Philosophy* (Dordrecht: Reidel, 1983), which also does not provide AT numbers. CSMK provides selections from the conversation with Burman; for a full translation, see John Cottingham (ed.), *Descartes' Conversation with Burman* (Oxford: Clarendon Press, 1976).

I note some translation choices. I translate *cognitio* sometimes as "knowledge" but sometimes as "cognition," using the latter to distinguish a bare cognition (possessing content but remaining

unaffirmed) from a judgment (involving the will) such as might yield knowledge (a difference that is especially important in Meds. 4–5). I translate Latin *praejudicium* and French *préjugé* as "preconceived opinion," in order to avoid the modern connotations of the English "prejudice." Latin *species* was a scholastic Aristotelian technical term in Descartes' day, meaning "image" or "likeness"; it entered English as a technical term, so I render it as "species," again to mean an image or likeness in this technical sense. Finally, I have rendered the Latin *per se notum* as "self-evident" and not by the more literal "known through itself." I take my lead from Descartes' discussion in the Geometrical Arguments (Second Replies, 7:163–64), where he relates that certain truths are *per se notum* to some people ("self-evident"), while the same truths may become known to others only by means of discursive reasoning. Descartes' "self-evidence" does not have the connotation of knowable immediately upon first encounter, so that some propositions become self-evident only after due consideration of what they say. See Edwin Curley, "The *Cogito* and the Foundations of Knowledge," in Gaukroger, *Descartes' Meditations*, 30–47, on p. 34, for discussion (and contrary advice).

References to additional discussion and alternative interpretations, as well as citations providing factual support, are collected at the end of each chapter. After their first mention, secondary works are referred to by author or author and short title. A selected list of recent English-language works on Descartes is found at the end of the volume.

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Part I

OVERVIEW AND SYNOPSIS

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1

DESCARTES' PROJECT

In 1641, at the age of 45, Descartes published the *Meditations on First Philosophy*. First philosophy is another name for metaphysics, the study of the basic principles of everything there is. Descartes understood metaphysics to ground knowledge of the self, of God, and of the natural world; and he intended his *Meditations* to enable its readers to discover the one true metaphysics for themselves. It was a very ambitious work.

The *Meditations* describes itself as a work on "God and the soul" (7:1). And indeed it argues that God exists and that the soul or mind is distinct from the body. In preparation, it raises and overturns skeptical challenges to the possibility of knowledge. On the surface, it appears to be a work about the possibility of knowledge concerning theological topics.

Looking more closely, Descartes' aims were far from traditional. In letters to his friend Marin Mersenne, he secretly confided (3:298) that this work contained "all the principles" of his physics (3:233). His talk of God and the soul was interlaced with metaphysical foundations for a revolutionary new physics or natural philosophy. His aim was to overturn the prevailing theory of the

natural world, which put humankind at the center of things, and replace it with a radically new vision of nature as a grand but impersonal machine. Because he wanted his revolutionary intentions to remain hidden from first-time readers, no part of his book is labeled "principles of physics" or "theory of the natural world." We shall have to uncover his radical agenda for ourselves – an agenda that had tremendous influence on the subsequent history of philosophy and science.

To understand what Descartes wanted to do in the *Meditations*, we need to place that work in the context of his life and times and other writings. His intellectual career did not begin with aspirations to found a new metaphysics, but with specific questions in mathematics and natural philosophy. This chapter reviews Descartes' context and career, and the next considers the structure of the *Meditations* as a philosophical text. Part II examines the six Meditations, one by one. Part III surveys his revolution in science as supported by the *Meditations* and sums up his philosophical legacy for us today.

DESCARTES' WORLD

Descartes' childhood and youth occurred during a time of relative peace and stability in France. The French Wars of Religion (1562–98), pitting Catholics against Calvinist Protestant Huguenots, formally ended in 1598 when Henry IV issued the Edict of Nantes, offering Huguenots religious toleration (but forbidding them from worshiping publicly in Paris). Henry had converted from Huguenot to Catholic. Despite his assassination by a deranged man in 1610, France largely enjoyed internal peace, save for a Huguenot uprising in 1626 over eroding toleration.

With the defeat of the Spanish Armada by England in 1588, a long-standing French foe was weakened. During the 1570s, the United Provinces (Protestant) in the northern Netherlands, where Descartes settled for much of his adult life, had broken from the remaining Spanish (Catholic) provinces. By 1590, Spain effectively acknowledged this loss, although both sides kept armies on the border between the Spanish and Dutch Netherlands.

France offered intermittent support to the latter, consonant with its long hostility toward Spain.

As Descartes reached maturity, in 1618 the Thirty Years' War erupted in the (mainly Catholic) Holy Roman Empire (largely, the German-speaking lands). After Henry IV's death, Louis XIII became king, with his mother, Marie de Medici, as regent. She arranged for Louis to marry a Spanish princess so as to improve relations with Spain. Even after her regency ended in 1617, France was initially favorable to Catholic forces supporting the Empire (Spain and the Empire were ruled by separate Habsburg dynasties). In 1631, with Marie long neutralized and Cardinal Richelieu as minister, France allied itself with Protestant Sweden, against the Habsburgs. King Gustavus Adolphus had invaded Germany in 1630. Swedish might initially prevailed, but by 1635 France felt the need to declare war on both the Habsburg Empire and Habsburg Spain. The Dutch provided funds and some troops, but their territory was removed from battle. Catholic France and Protestant Sweden together secured victory, and the shape of modern Europe was laid down in the Peace of Westphalia (1648), which formally recognized the Dutch Netherlands.

In Descartes' school years and after, the intellectual world was in turmoil. In the later Middle Ages, church doctrine had become bound up with the philosophy of Aristotle. On the one hand, there was a vibrant and ongoing development of this philosophy in the universities, from the thirteenth century onwards, which included testing and adjusting Aristotelian philosophy in relation to the newly accessible (in the fifteenth century) Platonic and other ancient works, as well as in relation to new criticisms – all the while reconciling it with the faith. There was a role for philosophy in religion, and indeed a session of the Fifth Lateran Council (1513) made it an article of faith that the existence of God and the immortality of the soul could be proved by reason alone (in addition to being accepted through faith). On the other hand, the subsequent Council of Trent (1545–63) condemned Protestantism as heresy and stringently banned innovative philosophical doctrines. Philosophy was allowed, but it was required to reach results considered to be orthodox. This orthodoxy embraced mainstays of Aristotelian thinking, including accounts of sensory

qualities; of natural processes of change, both organic and inorganic, as depending on the operation of an active principle, or form, in each type of body; of the natural position of the Earth at the center of the universe; and the doctrine of four causes, according to which purpose pervades nature.

As the seventeenth century opened, new philosophical doctrines were on the rise. At this time, "philosophy" included natural philosophy or the theory of the natural world. In astronomy, Nicolaus Copernicus had published *On the Revolutions* in 1543, which argued that the Sun is at (or near) the center of the universe and that the Earth revolves yearly about the Sun and rotates daily on its axis. This claim, if true, would vitiate Aristotelian physics, which held that earthy matter naturally seeks the center of the universe. Copernicus' doctrine at first caused little stir, but by 1600 it was becoming associated with other novelties, such as Giordano Bruno's claim that the universe is infinite and includes many stars besides our Sun. Johannes Kepler produced work supporting the Copernican system about this time. The Danish astronomer Tycho Brahe offered a compromise in which the Earth is at rest, the Sun revolves yearly, and the other planets revolve about the Sun. Although Copernicus had used extant astronomical observations, Tycho, using special instruments, supplied Kepler with new, more accurate observations that led him to propose that the planetary orbits are ellipses, as opposed to combinations of circular motions as others held. In 1610, Galileo Galilei made telescopic observations of the mountainous surface of the Moon and discovered the moons of Jupiter. These findings went against Aristotelian views that the Moon is a smooth sphere and that all heavenly bodies revolve about the Earth. Descartes would eventually defend the Copernican system, though not without trepidation, especially following Galileo's condemnation by the Roman Inquisition in 1632 for defending Copernicanism and perhaps also for espousing atomism.

In the early seventeenth century, there was a revival of interest in non-Aristotelian accounts of the structure of matter, including chemical theories and ancient atomism. Descartes accepted atoms in his earliest writings. Atomism held that bodies are composed of indivisible ("atomic") bits of matter that move about in an

empty space or void. The properties of visible bodies arise from formations of atoms. The ancient atomism of Democritus, Epicurus, and Lucretius was ever more under discussion. Galileo's *Assayer* (1623) explained sensory qualities such as color in objects as depending on structures of atomic particles, which cause light to influence the human senses so as to produce a sensation of color that depends on the human mind for its existence.

A new spirit of observation was abroad. Francis Bacon called for the systematic collection of natural histories or observations of nature. Chemical and alchemical investigators created laboratories, physicians undertook human and animal dissections, Galileo measured the time course of balls rolling down inclined planes, William Harvey experimented with blood flow, and William Gilbert collected systematic observations of magnetic phenomena.

This was Descartes' world. Going forward, this chapter notes his interaction with orthodox and innovative positions, his own anatomical observations, and the fate of some innovators at the hands of the church.

EDUCATION

Descartes' education in a Jesuit school introduced him to the dominant Aristotelian tradition as interpreted by the scholastic philosophers of the Roman Catholic universities of Europe, against which he subsequently reacted. The Jesuits were excellent teachers of mathematics, and the rigor of that discipline inspired Descartes' initial thoughts of rebellion in philosophy. Not long after completing his schooling, he discovered some mathematical results for which he is justly famous. But from his schooldays, he held that, as compared with elementary mathematics and its clarity, philosophy badly needed reform, and he came to see himself as the person for the job.

Descartes was born in 1596 in the Touraine region of France, near Tours in the small town of La Haye (now renamed "Descartes"), where his mother had journeyed from the family home in nearby Châtellerault (in Poitou) to be with her own mother for the birth. His father, the son of a physician, was a member of the landed gentry and a councillor in the parliament at Rennes in

distant Brittany. His mother came from a family of land-owning merchants. She died in childbirth thirteen months after Descartes' birth. The young René lived with his maternal grandmother, with his older brother and sister. As was common for the sons of gentry, he went to boarding school, attending the Jesuit college at La Flèche, in nearby Anjou, from 1607 to 1615. The college was established in 1604 by Henry IV. In 1594, following an assassination attempt by a Jesuit student, Henry had expelled the Jesuits from Paris and closed their colleges across France. After reconciliation in 1603, he donated the palace at La Flèche for a new Jesuit college.

The Jesuits are a Roman Catholic religious order, known formally as the Society of Jesus, founded in Spain in 1539 by Ignatius of Loyola. Their mission was to improve the spiritual character of humankind, with a special emphasis on education. The order founded new colleges and universities and assumed control of many existing schools in France and elsewhere throughout the seventeenth and into the eighteenth century.

Jesuit schools, renowned for their quality, drew students of various backgrounds and aspirations, including prospective clergy, students preparing for law or medicine, and future civil servants, military officers, and merchants. The first six years of study focused on grammar and rhetoric. Students learned Latin and Greek and studied selections from classical authors, especially the ancient Roman orator Cicero, whose works were read as models of style and eloquence but also contained surveys of philosophical positions. Many of Descartes' fellow students left after the first six years, some entering society and some transferring to university, where after completing the arts curriculum they could continue directly into the higher faculties of law, medicine, or theology. Those who remained at La Flèche, including Descartes, completed the mathematical and philosophical portion of the arts curriculum in their final three years. Descartes was satisfied with his school, later attesting that none offered better philosophical instruction, even for those wanting to transcend traditional philosophy (2:378).

The early modern arts curriculum was not confined to the medieval seven liberal arts. Those seven arts consisted of the *trivium* (grammar, rhetoric, and logic), which except for logic were

covered in the first six years ("grammar school"); and the *quadrivium* (geometry, arithmetic, astronomy, and music), taught at La Flèche in the final three years. These final years included advanced work in the arts, consisting mainly in the branches of philosophy: logic, natural philosophy (also called physics), metaphysics, and morals.

The official Jesuit curriculum required that philosophical instruction follow Aristotle. The study of logic, physics, metaphysics, and morals drew upon Jesuit commentaries on Aristotle's texts, or on independent treatises (including simplified textbooks) that covered the Aristotelian subject areas. These commentaries and treatises sometimes departed significantly from Aristotle and the major medieval Christian interpreters, such as Thomas Aquinas and John Duns Scotus, although most of them contained core areas of agreement. Descartes knew such commentators both from school and from later reading; he explicitly mentioned (3:185) Francisco Toledo, Antonio Rubio, and the Coimbran commentators (who included Peter Fonseca). He also knew the work of Francisco Suárez (7:235) and admired the philosophy textbook of Eustachius a Santo Paulo (3:232), a member of the Cistercian Order and so not a Jesuit. He studied Aristotelian philosophy intensively during his final three years of college, and up to 1620 (3:185).

Descartes' studies in philosophy were not limited to the Aristotelian variety. The early study of Cicero introduced him to ancient atomists, Plato and Aristotle, skeptics, and Stoics. The Aristotelian commentaries of Toledo, Rubio, the Coimbrans, and others discussed a variety of positions, including atomistic physics and Platonic theories of knowledge, as well as the various Neoplatonic, Islamic, and Latin commentators on Aristotle. Although rejecting Platonic theories of knowledge, they nonetheless described in some detail the view that knowledge arises from the purely intellectual apprehension of Forms distinct from the sensory world. Descartes' mature theory of knowledge was closer to this Platonic intellectualism than to Aristotle's sense-based theory. But, while in school, the conflicts among philosophical positions made them all appear merely probable. Since none achieved the "certitude" and "self-evidence" of mathematics (6:7), he treated them all as if false (6:8).

Jesuit school mathematics comprised the abstract branches (geometry and arithmetic) and applied branches, including not only astronomy and music (from the quadrivium), but also optics and perspective, mechanics, and civil or military architecture. The ancient sciences of astronomy and optics were undergoing radical revision. Even at La Flèche, Galileo's discovery of the moons of Jupiter was celebrated in 1611, and Descartes would have taken part. In mathematical optics, Kepler published works in 1604 and 1611 contradicting ancient theory by showing that the eye forms an image on the retina; Descartes was familiar with these results by the 1620s.

After La Flèche, Descartes studied law at the University of Poitiers, graduating in 1616. His father wanted him to pursue law so that the family could gain a title of nobility (which they finally received in 1668), but Descartes was reluctant, instead enlisting in the army.

GENTLEMAN SOLDIER AND MATHEMATICAL SCIENTIST

In 1618, Descartes joined the forces of Maurice of Nassau, Prince of Orange, general of the army of the United Provinces (the Dutch Netherlands), a sometime recipient of French support in his standoff with the Spanish Netherlands. When Descartes joined the army at Breda, the United Provinces were in the ninth year of a 12-year truce with Spain. Breda was just north of the border with the Spanish Netherlands (present-day Belgium) and was the residence of Maurice as well as his mathematicians and engineers. In July, Maurice led part of the army north to Utrecht to intercede for one Calvinist faction against another. As part of the defensive force against the Spanish, Descartes stayed in Breda and did not see military action.

While garrisoned outside Breda, Descartes met the Dutch natural philosopher Isaac Beeckman, an event that changed his life. The two first conversed on 10 November 1618 in front of a placard stating a mathematical problem. Descartes was already interested in applied mathematics and military architecture. Both men were happy to find someone else who spoke Latin and knew

mathematics. Beeckman was soon challenging Descartes with problems in mathematics, musicology, kinematics, and hydrostatics, in a program of investigation that he dubbed "physico-mathematics." He encouraged Descartes to think of material things as composed of small round spheres or indivisible atoms of matter. Some short writings remain (*10:67–74*) in which Descartes took this "atomistic" approach (later rejected in favor of infinitely divisible corpuscles). In December 1618, he completed his first book, the *Compendium on Music*, written in Latin and dedicated to Beeckman (published posthumously in 1650).

A NEW METHOD

Early in 1619, Descartes offered a solution to the long-standing problem of trisecting an angle, using a special compass of his own devising, and he discovered algebraic solutions to several classes of cubic equations. This work gave him new insights into the relation between geometrical constructions and algebraic equations. He designed a proportional compass constructed from hinged straight edges with perpendicular attachments sliding along them to create fixed proportions (in a continuous manner, as the device opens and closes). He used it to solve the Delic problem, of finding two mean proportionals between given values. The compass could represent algebraic equations, including cubic equations (involving a cube root in relation to other terms, such as $x^3 = ax^2 + b$). As the compass opens, the curves traced by interactions among the lengths along the arms and crosspieces express values of constants and unknowns in an equation. These techniques for treating algebraic equations as relations among straight lines became the basis for analytic geometry.

Descartes excitedly proclaimed to Beeckman on 26 March 1619 that he now envisioned a "wholly new science" concerning quantities (10:156–57). He contrasted his project with the *Ars brevis* ("Compendium on Method") of Ramon Llull, a thirteenth-century Majorcan knight turned monk. Llull claimed that his method, which manipulated words or concepts organized under headings, could solve problems of any kind. Descartes considered it a sham (6:17, 10:164–65). His own new method would be limited to

relations of quantity. By combining lines representing continuous or discrete quantities, it would solve "all problems that can be posed involving any sort of quantity" (10:156–57).

There is no evidence that Descartes had originally wanted to find a new method of any sort. He and Beeckman were working on specific problems in pure and applied mathematics. His early results typically extended previous mathematical methods involving proportions, making them more general. The breakthrough of 1619 foreshadowed a lifetime of fascination with method (shared by his contemporaries), eventually extending beyond mathematics to philosophy and metaphysics.

Descartes' early work in mathematics relied on geometrical and algebraic techniques that typically did not include syllogistic formulations. Geometrical works stated axioms, definitions, and postulates, from which theorems were proved. Proofs took the form of instructions for constructing figures using compass and straight edge. There was no thought that logic underlay mathematics (a nineteenth-century idea). Descartes considered the syllogism too cumbersome for original reasoning, though useful for presenting known results (e.g., 6:17). Indeed, syllogisms were sometimes used in presenting mathematical results, but Descartes did so only rarely (10:70) and not in his famous *Geometry*. (Syllogisms and mathematical demonstration are discussed in the Appendix.)

A MISSION IN LIFE

Despite his mathematical achievements, Descartes remained uncertain where "fate" would lead him (10:162). He wrote to Beeckman in April 1619 of plans to join the army in Germany (10:162), where the Thirty Years' War was brewing. Calvinist Protestants in Bohemia (now in the Czech Republic) had challenged the authority of their Catholic prince, Ferdinand, who had become Holy Roman Emperor in March. On arriving in Germany, Descartes joined the Catholic army of Maximilian I (Duke of Bavaria, supporter of the new emperor, and an erstwhile ally of France) and was present in Frankfurt (am Main) for Ferdinand's coronation in September. In the meantime, the Protestant

Frederick V had been crowned king of Bohemia by the Calvinist nobles, and war was imminent.

Descartes was returning to the army in Bavaria after the coronation when winter caught him in Neuburg, a peaceful Catholic principality on the Danube north of Munich. While there, he settled on a new course in life. In the *Discourse on the Method* he recalls his interrupted travel and reports that "finding no conversation to divert me, and otherwise, fortunately, having no cares or passions that troubled me, I stayed all day shut up alone in a stove-heated room where I had complete leisure to converse with myself about my thoughts" (6:11). Reflection convinced him that he should extend the clarity of his new science of proportion to the other sciences (6:20–21), seeking clear and distinct connections among ideas in other fields to match the perspicuity of algebra and geometry (6:19–20). Because the principles of other sciences "must all be derived from philosophy" (including natural philosophy), he resolved "to try to establish some certainty there" (6:21–22).

His decision to reform the sciences was partly inspired by three dreams on 10 November 1619. We know their content primarily through Adrienne Baillet's 1691 biography of Descartes (but see 10:216). The dreams were complex, involving whirling wind, a melon, acquaintances passed without greeting, thunder, sparks, pain in the side, disappearing books, and a poem by Ausonius, "What road in life shall I follow?" Descartes interpreted them as commanding him to reform all the sciences, that is, all organized knowledge. He began by seeking new foundations for philosophy, and by his own account it was nine years before he found them (6:30).

His early notebooks recount some of his philosophical ideas near the time of the dreams. He favored a sense-based epistemology. ("Epistemology" means theory of knowledge, which in Descartes' day encompassed descriptions of the cognitive faculties of the mind, such as the senses or intellect.) Contrary to his later views, he wrote that "humans have knowledge of natural things only through their resemblance to things that fall under the senses" (10:218). He thought it best to conceive even "spiritual things" by making use of "certain bodies perceivable by the

senses, such as wind and light" (10:217). As he explained, "wind signifies spirit," and "light signifies knowledge" (10:218). The comparison of spirit to wind or fine matter was similar to the ancient philosophies of Democritus, Epicurus, and the Stoics.

Descartes reports that in the stove-heated room he worked out the provisional moral code set down in Part Three of the *Discourse*. A source for part of the code has recently been discovered. A copy of Pierre Charron's *Traité de la sagesse* ("Treatise on Wisdom"), found in Neuburg, was inscribed to Descartes by a Jesuit father during the winter of 1619. Charron was a philosophical skeptic who said he knew nothing. He recommended that in one's state of ignorance, one should simply obey the laws and customs of the country in which one lived. Descartes' first moral precept is a version of this advice, "to obey the laws and customs of my country" (6:22–23).

Although familiar with the revival of philosophical skepticism, Descartes was not inclined toward becoming a skeptic. He shared with ancient skeptics the desire to investigate his beliefs. But in uprooting his errors, he says, "I was not imitating the skeptics, who doubt only for the sake of doubting and pretend always to be undecided; for, on the contrary, my whole aim was toward certainty" (6:29). Like the skeptics, Descartes investigates his beliefs to ascertain their truth; but true skeptics end up suspending judgment concerning truth and are guided by appearances or what seems probable. Descartes employed the skeptical technique of suspending judgment to bracket some beliefs so that he might discover other truths possessing the clarity and evidence of mathematics.

THE METHOD MADE GENERAL

The *Discourse* reports that, upon leaving his warm room, for nine years (1619–28) he did nothing but "roam here and there in the world, trying to be a spectator more than an actor in all the comedies that play there" (6:28). In fact, he did not merely roam. During 1620, he continued to work on scientific and mathematical problems. He may have visited Ulm (west of Neuburg on the Danube, in present-day Württemberg) and consulted with

the mathematician Johannes Faulhaber, who taught at the military college. He may also have been present at the Battle of White Mountain in November, when Frederick was defeated and forced into exile at The Hague, where Descartes later (in 1642) befriended his daughter, the Princess Elisabeth (only two years old in 1620). After visiting France in 1622, he spent two years in Italy, 1623–25; presumably, he made good on his pledge (10:218) to visit the pilgrimage site of Loretto. Upon his return (or just prior to leaving in 1622), he fought a duel (disarming but sparing his foe) and perhaps composed his lost treatise on fencing.

He continued to study philosophy, for later he recalled examining works by Tommaso Campanella around 1623 (2:659) and not being much impressed. In any case, by 1630 he could list the Italian anti-Aristotelian innovators of the time, including, besides Campanella, Sebastian Basso, Giordano Bruno, Bernardino Telesio, and Lucilio Vanini (1:158). He would also have known that Bruno and Vanini were burned for their heretical views – respectively, in 1600 in Rome and 1619 in Toulouse – which, besides anti-Aristotelian natural philosophy, included direct attacks on the Christian faith, and that Campanella was confined to a convent for several years for his anti-Aristotelianism and later imprisoned for twenty-seven years for social heresies. Upon returning to Paris in 1625, Descartes would have learned that in 1624 the Theological Faculty of the Sorbonne, supported by the Medical Faculty and the Parliament of Paris, had forbidden a public defense of anti-Aristotelian theses (chemical and atomistic) and exiled the defenders from Paris.

In these years, Descartes worked intermittently on a book on "universal mathematics," presenting his new method. The uncompleted manuscript, published in Latin in 1701 as the *Rules for the Direction of the Mind*, contained twenty-one out of a projected thirty-six Rules. In it, he sought to extend a method like that in mathematics to "any subject whatsoever" (10:374). He claimed that all mathematical sciences could be recast as a single discipline with "order or measure" as its subject matter (10:378), to be investigated using his new science of proportion. He further contended that the sciences in general depend on certain "pure and simple natures," which any investigator should seek first

(10:381). This search for simple natures or simple ideas lay at the heart of his generalized method, extended beyond mathematics.

The generalized method of the *Rules* was later summarized in the *Discourse*, now distilled into four rules:

> The first was never to accept anything as true that I did not evidently know to be so: that is, carefully to avoid haste and bias and to include nothing more in my judgments than what presented itself to my mind so clearly and so distinctly that I could have no occasion to place it in doubt.
>
> The second was to divide each of the difficulties that I examined into as many parts as possible and as may be required in order to resolve them better.
>
> The third was to direct my thoughts in an orderly manner, by beginning with the simplest and most easily known objects in order to ascend little by little, gradually, to knowledge of the most complex; and even assuming some order among objects that have no natural order of precedence.
>
> And the last was everywhere to make enumerations so complete and reviews so comprehensive that I would be sure of omitting nothing.
>
> (6:18–19*)

The first rule states a general standard of clarity and certainty. The second and fourth summarize procedures used in solving a problem in algebra (e.g., dividing the problem into various simpler equations and checking over one's work); but they also portray a more general strategy of fully analyzing problems into their elements so that nothing relevant is overlooked. The third states a more general principle of method, to start with simple and easily known objects and to think of the complex objects as knowable through the simple ones.

The *Rules* and *Discourse* assert that knowledge in all fields contains certain "simple natures" (10:381) or "simplest things" (6:19), known with mathematical clarity and self-evidence. What are these simple natures? Rule Six says that the qualities of such natures include being "independent, a cause, simple, universal, single, equal, similar, straight, and the like" (10:381) but offers

no examples of the natures themselves. Rule Eight outlines the steps for solving a problem in optics and alludes to the notion of a "natural power," without revealing what such a power is (10:395). Rule Twelve finally provides examples of three sorts of simple nature: purely intellectual things, known by the mind about the mind, including notions of knowledge, doubt, ignorance, and volition or willing; material natures as present in bodies, including shape, extension, and motion; and things common to minds and bodies, including existence, unity, and duration (10:419). This suggests a basic division of the simple natures into mental and bodily or material. But in this work Descartes does not claim, as he would later, that bodies have *only* the properties of spatial extension, such as shape and motion.

Descartes' hope for extending the clarity and certainty of mathematics to other topics depended on finding simple constituents everywhere. In elementary mathematics, we follow the method of the *Rules* when, in adding large numbers, we resolve the computation into smaller ones whose truth we can grasp intuitively, such as $2 + 3 = 5$. The generalization of this method requires that other fields be reducible to correspondingly simple ideas and entities. If complex things are in fact constituted through combinations of basic entities, we might comprehend those things by isolating in our thought the simple ideas of such entities and then combining them. A nice method, if we can find the simple ideas, and if they and their combinations actually fit the way the world is.

When Descartes returned to Paris in 1625, he briefly flirted with obtaining an administrative post but then was freed from his father's demand to enter civil administration as an attorney. He remained in Paris until 1628, joining a group of mathematicians and intellectuals that included the Minim friar Marin Mersenne, an advocate of mathematical descriptions of nature and an organizer of intellectuals, Claude Mydorge, a mathematician also interested in optics, and Guillaume Gibieuf, a theologian at the Sorbonne. During this time, he discovered the sine law of refraction and solved the problem of the anaclastic (i.e., showing mathematically how to focus parallel rays to a single point), which informed his work on telescope lenses. Rumor of his method

spread, and he endeavored to finish the *Rules*. But he abandoned the work in 1627–28, near the end of the section on algebraic solutions to "perfectly understood" problems and prior to writing the projected section on problems "not perfectly understood" (10:429). Perhaps he discovered limitations on his scheme to represent all mathematical problems through relations among line segments. In any event, the thrust of his investigations now turned toward metaphysics and a new science of nature as a whole.

METAPHYSICAL TURN

In 1628 and 1629, Descartes reformulated his intellectual agenda. Late in 1627, he attended a public lecture by a chemist named Chandoux, which had been arranged by the Papal Nuncio in Paris (showing that some ecclesiastics were interested in non-Aristotelian natural philosophy). The lecturer criticized Aristotle's natural philosophy and proffered a chemically based alternative. Those present all applauded, except Descartes. Cardinal Bérulle – the founder of the Parisian Oratory and a disciple of Augustine of Hippo's Neoplatonism – asked why Descartes disapproved. In answer, Descartes praised the speaker's rejection of Aristotle's philosophy but chastised him for offering merely probable opinions in its place. He proclaimed that he himself possessed a universal method for separating the true from the false with certainty. Bérulle called upon him to give the fruits of his method to the world (1:213; see *Meditations*, 7:3).

As it happens, Descartes devoted the rest of his life to intellectual pursuits. He eventually published four major books – covering geometry, optics, the physical world, the human body and human emotions, and metaphysics – and others were left unpublished at his death in 1650. Throughout his intellectual development, he retained his method of searching for simple notions, but his account of the cognitive basis for his method changed.

Descartes spent the winter of 1627–28 in Brittany and Poitou with his family, a time that he later described (5:558) as an "apprenticeship" for the solitude he subsequently sought in the Netherlands. Late in 1628, he returned to the Dutch Netherlands, where he remained for more than twenty years. The main

explanation for his leaving France was the need for solitude to work (1:638), away from the demands of Paris intellectuals and chatty country neighbors alike (1:203, *3:616*). In the Netherlands, he relocated frequently, never staying a full three years in any one place, and he guarded his address (*1:191*). His residences included larger cities, such as Amsterdam, which he initially preferred (1:203–4), the university towns of Franeker, Leiden, and Utrecht, and villages, both coastal and inland. After 1641, he was found mainly in the coastal villages of Endegeest (near Leiden) and then Egmond. These facts are consonant with Descartes' remembrance of being born in "the gardens of Touraine" (5:349), and with his motto "who lives well hidden, lives well" (1:43).

He now undertook a sustained investigation of metaphysical topics for the first time. During his first nine months in the Netherlands he worked on nothing else. In April 1630, he wrote to Mersenne about his results. He had discovered "how to demonstrate metaphysical truths in a manner which is more evident than the demonstrations of geometry" (1:144*). For someone who previously held mathematics as the ultimate standard of certainty, this statement marks a significant change. The letter also reports that metaphysical investigations concerning God and the self (the soul or mind) allowed him to discover "the foundations of Physics" (1:144). Although it is uncertain whether Descartes was at this time closely familiar with the Augustinian philosophical theories embraced by Bérulle, his claim to find knowledge of first principles by turning to God and the soul echoed Augustine's procedure in the *Confessions* (ch. 7). We shall soon see evidence that by 1629 he had rejected the sense-based epistemology of 1620 and adopted a position closer to the Platonic theory that primary truths are known through purely intellectual (non-sensory) contemplation.

The same letter announces the radical metaphysical thesis (later published in the Objections and Replies to the *Meditations*) that "the mathematical truths, which you call eternal, have been established by God and depend entirely on him, just like all his other creations" (1:145). By this he meant that mathematical truths are free creations of God, dependent on his will, and that he could have willed them otherwise. In other words, God might

have made it that the three angles of a triangle do not equal two right angles, or that $2 + 3 \neq 5$ (further discussion in Ch. 9). This position differed both from the scholastic Aristotelian view that the eternal truths are grounded in the essence of God, either in his very being or in his intellect, and from the properly Platonic view that the eternal truths are independent of God and are grounded in eternal Forms that determine the rational structure of thought and all existent things – which copy (or dimly reflect) those Forms.

During these nine months, Descartes drafted an early version of his metaphysics (see 1:350), containing the "first meditations" that the *Discourse* (6:30–40) dates to this time and describes as containing the basic ideas of the *Meditations*.

A UNIFIED PHYSICS

Descartes' metaphysical musings were interrupted in summer 1629 by a scientific problem. In April, Christopher Scheiner had observed a set of false suns, or parhelia, near Rome. A report circulated among natural philosophers. When Descartes learned of it, he set to work to explain this optical phenomenon. Parhelia are now known to be caused when ice crystals in the upper atmosphere reflect and refract the sun's light. Descartes advanced the theory that the highest clouds are made of ice crystals and snow, which circular winds melt and refreeze so as to form a solid, transparent ring of ice, portions of which act as lenses to produce the parhelia (6:355).

Although this solution is fanciful (a solid ring is not formed in the sky), his attempt to explain this complex natural phenomenon drew Descartes into general physics more fully than before. He soon wrote to Mersenne that completion of his work on parhelia would be delayed about a year, since "instead of explaining a single Phenomenon, I am determined to explain all the Phenomena of nature, that is, the whole of Physics" (1:70). One year became three. Since at this time "physics" meant the study of all of nature, including living things, Descartes had indeed expanded his project greatly, beyond optics and atmospherics to include all chemical, mineralogical, geological, biological, and even psychological phenomena.

The project developed into a major work, which Descartes modestly entitled *The World*. It was to have three parts: a treatise on light (which would contain a general physics), a treatise on man (covering human physiology), and a treatise on soul or mind. Only the first two parts are extant (the third was either destroyed or never written). These two parts contain a new comprehensive vision of material nature.

In Descartes' youth, the accepted opinion remained that the Earth holds a unique place at the center of the universe, with the Sun and planets traveling around it. Natural processes, such as growth and decay, or even the freezing and thawing of water, were considered to take place only on or near the Earth. Some theories posited a crystalline sphere to carry the Moon around the Earth, and to separate the sublunary region of change from the immutable heavens. On this view, terrestrial and celestial physics are fundamentally different. In overturning this picture, Descartes went far beyond the Copernican hypothesis placing our Sun at the center of the universe with the Earth moving about it. He contended that the Earth is one among many planets, revolving around many different suns distributed throughout the cosmos. He further proposed that the whole universe is made of one kind of matter, which follows one set of laws.

While others, including ancient atomists and Stoics, had sketched part of this new picture, Descartes' vision of a unified physics governed by a few laws of motion was richer and more detailed. He envisioned providing "mechanical" explanations for all natural phenomena. Such explanations start from the notion that all objects are composed of one uniform matter, consisting of particles (corpuscles) varying only in the size, shape, and motion, whose configurations account for object properties and behaviors.

This combination of breadth and unity was unprecedented in Descartes' earlier work with Beeckman, or in the works of Copernicus, Galileo, or Kepler. His vision set the framework for Newton's subsequent unification of mechanics and astronomy, and it is no accident that Newton was reading and taking notes on Descartes' physics (as subsequently published in the *Principles*) during the mid-1660s, his initial years of insight. To explain Descartes' expanded vision we can look to the metaphysical

researches of 1629, which yielded "foundations of Physics." These foundations supported his picture of a universe governed throughout by a few natural laws and underwrote his claim to know the one, true nature of all matter in the universe.

In a chapter of *The World* entitled "The Laws of Nature of this new world," Descartes related the laws of motion to the activity of God. He composed the entire work as a fable, in which God creates a new universe "like ours" (and clearly intended to be ours) beyond the boundaries of the Aristotelian universe of his schoolbooks (11:31–32). In this "new" world, God creates a single uniform matter, with extension as its essence, having only the properties of size, shape, and motion (11:33–34, 36), and he imparts a fixed quantity of motion to this matter. Because God is immutable, he preserves this quantity from creation onward. Descartes explains how an immutable God can govern the motions of a changing world:

> With God always acting in the same way and consequently always producing substantially the same effect, there occur many differences in this effect, as if by accident. And it is easy to accept that God, who is, as everyone must know, immutable, always acts in the same way. Without, however, involving myself any further in these metaphysical considerations, I will set out here two or three of the principal rules according to which we must believe that God causes the nature of this new world to act, and which will suffice, I believe, to acquaint you with all the others.
>
> (11:37–38)

He then sets out three rules or "laws of nature," which depend "solely on God's conserving each thing by a continuous action" (11:44*). These laws, including a counterpart to Newton's law of inertia, are examined more fully below (Ch. 9).

Descartes recognized no additional laws in his world except "those that infallibly follow from the eternal truths on which mathematicians are accustomed to support their most certain and most evident demonstrations; the truths, I say, according to which God Himself has taught us He disposed all things in number, weight, and measure" (11:47). Allusion to the biblical

phrase "but thou hast ordered all things by measure and number and weight" (Wisdom of Solomon, 11.20) was commonplace, but Descartes now explains that God "taught us" these truths by implanting them in the mind or soul.

> The knowledge of these truths is so natural to our souls that we cannot but judge them infallible when we conceive them distinctly, nor doubt that, if God had created many worlds, they would be as true in all of them as in this one. Thus those who know how to examine sufficiently the consequences of these truths and of our rules will be able to recognize effects by their causes and, to explain myself in scholastic terms, will be able to have demonstrations *a priori* of everything that can be produced in this new world.
>
> (11:47)

The relevant scholastic meaning of the term "*a priori*" here is "reasoning from cause to effect." Such reasoning need not rely on experience of the causes and effects, for in this context what is "natural" to our souls is innate. We have seen that Descartes considered the eternal truths of mathematics to be free creations of God. Perhaps a further metaphysical insight of 1629 was that God, in decreeing those truths, made them true in the world he created and implanted knowledge of them in the human mind, thereby explaining our capacity to discern the true foundations of physics in the mathematical essence of matter (as Descartes believed he was the first to do).

After three years of work, Descartes had produced (at least) the first two parts of his *World*, the general physics and the treatise on man. The second of these ambitiously offered (or promised) entirely mechanistic explanations of human physiology and parts of human psychology. In connection with this work and in subsequent years, Descartes visited butchers' shops to watch animals being slaughtered, took home animal parts for dissection on numerous occasions (1:263; 2:525, 621), and participated in vivisections of fish, rabbits, and dogs (1:523, 526–27, 11:241).

Late in 1633, Descartes learned that Galileo had been condemned by the Roman Catholic Inquisition for defending the Copernican hypothesis. Since he affirmed that hypothesis in his *World*, he

suppressed the work. He was loyal to the Church but also concerned at being made "a criminal" for affirming the theory; he considered burning all his papers (1:270–71). The extant parts were published posthumously in 1664 (in French), as *The World, or Treatise on Light* and the *Treatise on Man*.

THE *DISCOURSE* AND THE METHOD

After the Galileo affair, Descartes did not give up his project of reforming the sciences. In 1637, he offered a sampler, the *Discourse on the Method* together with essays on *Dioptrics*, *Meteorology*, and *Geometry*. These works were written in French, making them accessible to literate people outside the universities, including artisans, people at court, and women (1:560). Latin was the language of learning in European universities and the language of nearly all philosophical works, but some philosophical and scientific authors, including Francis Bacon and Galileo as well as Descartes, had begun to publish in their native languages (English, Italian, and French).

Descartes used the *Discourse* to introduce his program of scientific work to the public, to sketch some metaphysical results, and to ask for money to support the empirical observations needed to decide among his own rival scientific hypotheses (6:65). (Although publication was anonymous, the identity of the author was soon known.) The metaphysical discussions, found in Part Four, include the skeptical dream argument, the famous *cogito* argument ("I think, therefore I am"), an argument that mind and body are distinct substances (mind–body dualism), a proof for the existence of God, and an argument that the clear and distinct perceptions of reason are true (6:31–40). We consider these arguments through their fuller (and sometimes different) counterparts in the *Meditations*.

After the *cogito* argument appeared in the *Discourse*, Mersenne and others (2:435, 3:247) asked about its similarity to a passage in Augustine's *City of God* (Bk. 11, ch. 26). As we will see in reading the *Meditations*, Descartes' philosophy has affinities with Augustine's. Nonetheless, Descartes replied to his correspondents that he was (in 1637–38) unfamiliar with Augustine's works

(*1:376*, 2:535). He promised to consult them, which he had done by 1640 (3:247). Assuming that in 1637 he did not know Augustine's works directly, he might have become familiar with their content through the Augustinians Bérulle and Gibieuf. (Although Bérulle died in 1629, Descartes maintained contact with Gibieuf [1:16–17, 153; 3:184, 237].) Another argument in the *Discourse* – starting from his ability to conceive of something more perfect than himself and concluding that only an actually perfect being, God, could have given him this ability (6:33–35) – also echoes Augustine. Descartes might have gleaned this argument from his Augustinian contacts or read in Cicero a similar argument due to the ancient Stoic Chrysippus.

The essays attached to the *Discourse* were supposed to exhibit the results of his method, and in fact they offered several bits of his physics (although not his whole *World*). The *Dioptrics* sketched his physics of light, explicated the laws of reflection and refraction, described the gross anatomy and physiology of the senses and eye (including the formation of the retinal image), gave explanations for the perception of light, color, size, shape, and distance, and described lenses for correcting vision and for telescopes, as well as a machine for cutting them. The *Geometry* presented his solution to an ancient problem in mathematics, the "Pappus locus problem" – to describe a set of points (a locus) in relation to four (or more) given lines, such that from the points four lines can be drawn to intersect the four given lines at equal angles, with the newly drawn lines standing in a given ratio among themselves. In presenting his solution, Descartes provided the basis for algebraic or "analytic" geometry, including what became the Cartesian coordinate system (although he did not privilege rectangular coordinates himself). The *Meteorology* began from certain "suppositions" or hypotheses that stated his basic assumptions in natural philosophy – that "the water, earth, air, and all other such bodies that surround us are composed of many small parts of various shapes and sizes, which are never so properly disposed nor so exactly joined together that there do not remain many intervals around them; and that these intervals are not empty but are filled with that extremely subtle matter through the mediation of which, I have said above, the action of

light is communicated" (6:233*). Using these assumptions, the work offered explanations for atmospheric, mineralogical, and visual phenomena, including the bands of the rainbow. (Descartes [1:559] considered this explanation of the rainbow to be the only full example of his method in the *Discourse* and essays.) Taken together, the *Dioptrics* and *Meteorology* offered a mechanistic, corpuscular explanation of light, color, and other "secondary qualities" (as they were later called), in terms of the motion of particles and the effect of those motions on perceivers. Color as experienced became a perceiver-dependent sensation, by contrast with Aristotelian "real qualities" transmitted from the object to the perceiver's mind.

Although the suppositions in the *Meteorology* laid out the fundamental entities in his physics, Descartes did not openly reject other explanatory entities. In particular, he did not explicitly deny the active principles or substantial forms, and real qualities, of Aristotelian physics. He simply observed that his physics had no need for such things (6:239). Further, while claiming that he could "deduce" his physical assumptions from his metaphysics, he did not provide the deduction (6:76). For now, the corpuscularian principles of his physics would simply be "proved" through effects, that is, through their ability to explain a wide variety of phenomena, including new empirical observations (see also 1:423–24, 563; 2:199).

Descartes' metaphysics as summarized in Part Four did not mention the claim, crucial for his physics, that the essence of matter is extension. The promised metaphysical foundations for his physics must include that claim, as well as the role of God in conserving the world, both first published in the *Meditations*.

In 1638, Descartes explained to a Jesuit at La Flèche, Antoine Vatier, that he had omitted the metaphysical proof for his physics because it employed skeptical arguments that he "did not dare" put before a general audience – hence, more radical than the dream argument. These stronger arguments presumably include the hypothesis that God might be a deceiver, found in the *Meditations* (7:21). He told Vatier that such radical arguments help the reader "withdraw the mind from the senses" (1:560). He also advised Mersenne that, the *Discourse* being in the vernacular, he abridged his skeptical arguments about the senses. But he

recalled that "about eight years ago I wrote in Latin the beginnings of a Metaphysics in which this argument is conducted at some length" (1:350). This timing coincides with his report, early in 1630 (1:144), that he discovered the foundations of physics by contemplating God and the soul. Presumably the *Meditations*, as the successor to the earlier metaphysical treatise, will show the connection among foundations for physics, sensory withdrawal, and God and the soul.

The *Discourse* invited readers to send their objections to the publisher (6:75), and Descartes was soon writing letters to defend his physical suppositions, his omission of substantial forms and real qualities, and his metaphysics, including mind–body dualism (e.g., 1:353, 2:38–45, 197–201). The Jesuit mathematician Pierre Bourdin attacked the *Dioptrics* in public disputations in Paris during 1640, and Descartes responded with a letter sent via Mersenne (*3:105–19*). After this attack, he became increasingly concerned about the Jesuit response to his work (3:126, 184, 752), for he wanted this powerful order, which had educated him, to support, and even to teach, his new philosophy (1:454–56, 2:267–68, 4:122).

THE *MEDITATIONS*

Descartes' correspondents (1:564) soon pressed him for the promised metaphysical foundations and the complete version of his physics. At first unwilling, in 1639 he promised to publish his metaphysics (2:622), which appeared as the *Meditations on First Philosophy* (Paris, 1641), including Objections by philosophers and theologians and Descartes' Replies.

As a named field, "first philosophy" was invented by the ancient Greek philosopher Aristotle, to mean the study of the most basic principles of things. Aristotelian metaphysics examined being in general, that is, the fundamental properties of everything that has being or exists, with a focus on substances as primary existents. It included the highest being, which Aristotle called "god." Because first philosophy extended beyond physics, Aristotle's followers called it "metaphysics," meaning literally "that which is beyond physics." Descartes' first philosophy or metaphysics also focuses on

substances, but now divided into just three types: God, mind or soul, and matter as extension.

Aristotle's medieval followers disagreed on whether metaphysics could provide the first principles specific to the other sciences, but they agreed that metaphysical principles are the last things learned, since they must be "abstracted" from experience and are the most abstract of all. Descartes, by contrast, held that metaphysics contains first principles specific to the other sciences, that these principles could be known *a priori* (without appeal to experience), and that they should be discovered first, to guide further investigation. In a later work he compared all knowledge to a tree, with metaphysics as the roots, physics as the trunk, and medicine, mechanics, and morals as limbs (9B:14).

Although in publishing his metaphysics Descartes was fulfilling a promise to provide foundations for his physics, he did not advertise that fact in the work and asked Mersenne to keep it quiet. The first edition carried the subtitle "In Which the Existence of God and the Immortality of the Soul Are Demonstrated," and the dedicatory Letter presented the work as focused on these topics, with philosophy supporting religion as enjoined by the Lateran Council (7:1–3). As the Synopsis observes, the work does not offer a demonstration for immortality (7:12–13). The subtitle to the second edition (1642) more accurately describes the book as one "In Which the Existence of God, and the Distinction of the Human Soul from the Body, Are Demonstrated."

Despite what the Letter says (7:2–3), the main aim of the work was not to support religious truths in the face of "unbelievers." Descartes revealed its primary aim to Mersenne: "the little Metaphysics I am sending you contains all the Principles of my Physics" (3:233). Still, no part of the *Meditations* openly promulgates principles of physics. Descartes explained this fact in another letter to Mersenne:

> I will say to you, just between us, that these six Meditations contain all the foundations of my Physics. But, please, you must not say so; for those who favor Aristotle would perhaps have more difficulty in approving them; and I hope that those who will read them will unwittingly become accustomed to my principles and will recognize

> the truth, before they notice that my principles destroy those of Aristotle.
>
> (3:297–98*)

He wanted to garner approval from "those who favor Aristotle." Partly this meant the approval of Church authorities, who might otherwise block publication given the close connection between Aristotelian philosophy and Christian theology (both Catholic and Protestant). We've seen that he hoped the Jesuits, who favored Aristotle, would eventually be willing to teach his philosophy.

Such political strategizing does not tell the whole story. Descartes had good methodological reasons, connected with his "analytic" method and with the textual organization of the *Meditations* into six Meditations, for not directly confronting his largely Aristotelian audience by introducing his fundamental principles up front. Moreover, although his emphasis on God and the soul in the dedicatory Letter surely was intended to curry favor with theologians, we have seen that Descartes earlier described contemplation of God and the soul as leading him to the foundations of his physics. The connections among his various claims about God and the soul, skepticism toward the senses, and physics will become apparent in Chapter 2 in examining the methodological structure of the *Meditations*.

SUBSEQUENT WORKS

Descartes began but left unfinished a dialogue entitled *The Search for Truth* (perhaps written while he waited for the *Meditations* to appear). The dialogue included a scholastic philosopher (Epistemon, or "knowledgeable"), an untutored man of good sense (Polyander, or "everyman"), and a stand-in for Descartes (Eudoxus, or "famous," although etymologically suggesting "good opinion"). It reprises arguments from the *Meditations* (up to Med. 2).

Although Descartes considered the metaphysical investigations portrayed in the *Meditations* and *Search* to be important, he did not think readers should devote constant attention to them. In 1643, he wrote to Princess Elisabeth of Bohemia (daughter of Frederick V) "just as I believe that it is very necessary, once in

one's life, to have properly understood the principles of Metaphysics, because they are what give us knowledge of God and our soul, I also believe that it would be very harmful to occupy one's intellect frequently in meditating on them, because that would not allow the intellect to concern itself as fully with the functions of the imagination and the senses" (3:695). Those functions guide practical action and aid the investigation of nature.

In the very letter informing Mersenne that he was sending him a draft of the *Meditations*, Descartes also told him that he was planning a textbook covering his entire philosophy, including the long-awaited physics (3:233, 272). He hoped that his Latin *Principles of Philosophy* would replace the prevailing Aristotelian curriculum in colleges and universities, at least in metaphysics and physics. He initially planned to publish the textbook together with an Aristotelian one, Eustachius a Sancto Paulo's *Summa philosophiae* ("Compendium of Philosophy"), annotated to show the comparative advantage of his own views (3:232). He soon abandoned that plan, believing that his principles so obviously destroyed opposing ones that direct refutation was unnecessary (*3:470*).

When the *Principles* appeared in 1644 it had four parts. The first reviewed the metaphysics of the *Meditations*. The second revealed the fundamental principles of physics, including the equating of matter with extension, the denial of a vacuum, and his three laws of motion. The third described the formation of solar systems and the transmission of light. The fourth concerned the formation of the Earth and the explanation of various physical phenomena. He had intended to add fifth and sixth parts, covering biological phenomena, including plants, animals, and the human animal, but he ended up simply appending to the fourth part a discussion of the human senses and sensory nerves (8A:315–23).

During the 1640s, Descartes engaged in polemic over the religious orthodoxy of his philosophy. The trouble began with disputations organized and published at the University of Utrecht in 1641, in which an early follower of Descartes, Henry le Roy (or Regius), defended mind–body dualism and the mechanistic view of matter and rejected Aristotelian substantial forms. The Calvinist theologian Gijsbert Voet (or Voetius) replied that mind–body dualism

makes a human being into an accidental collection of two different kinds of thing, rather than a genuinely unified being, and that denying that the human soul is the substantial form of the body might result in denying that humans have a soul altogether. In January 1642, Descartes advised Regius to reply that human beings are unified beings composed of body and soul (3:508) and to refrain from denying substantial forms outright; it was enough to say that they are not needed in mechanistic explanations (3:501–7). Regius' response to Voetius was confiscated by the municipal authorities of Utrecht upon publication. Descartes now entered the fray directly, defending Regius in the second edition of the *Meditations* (Letter to Dinet). The controversy widened, and in 1643 Descartes published a lengthy book in Latin, *Letter to Voetius* (8B:1–194). He narrowly avoided condemnation by the Calvinist authorities. When Regius broke ranks and published a brief attack on the *Principles* in 1647, Descartes responded with *Comments on a Certain Broadsheet* in 1648, reaffirming mind–body dualism and his proofs of God's existence.

In the meantime, Descartes' works were being vigorously discussed at the University of Leiden. In 1646, theology professor Jacob Trigland complained that other professors were allowing students to defend Descartes' philosophy, which he considered blasphemous and atheistic. Adrian Heereboord, a professor of logic who subsequently authored several books on Cartesian philosophy, defended Descartes in public disputations and orations. In May 1647, Descartes protested the charges against him in letters to the university curators (5:1–15, 35–39). Despite continued disputes, Leiden became a center for teaching, studying, and writing Cartesian philosophy and remained so for over fifty years.

At this juncture, Descartes had realized his ambitions in metaphysics and general physics, but not in medicine or morals. Earlier he had spoken of a health regimen to extend his own life by a century (1:649), although as he grew older he moderated such claims (2:480, 4:329). In the mid-1640s, he returned to his physiological studies with the aim of covering everything from embryology to human psychology. In 1647–48, he worked on but left unfinished his *Description of the Human Body* (published

posthumously in 1664, in French). The final work published in his lifetime, *The Passions of the Soul* (1649, in French), contained Descartes' theory of the emotions and his moral psychology. It responded to queries from Princess Elisabeth, who had also plied him with metaphysical questions concerning mind–body union and interaction.

In mid-April 1648, the young Frans Burman, son of a Protestant minister, visited Descartes in Egmond (Dutch Netherlands), armed with questions about his published works. He posed eighty questions about specific passages, forty-seven on the *Meditations* alone, the rest mainly on the *Principles* and *Discourse* (in Latin translation). From notes on Descartes' replies, he prepared a manuscript record of the discussion four days later, aided by Johann Clauberg. Although this record was written by Burman, not Descartes, it affords valuable information on Descartes' own interpretation of key arguments in the *Meditations*.

Late in 1649, Descartes accepted the invitation of Queen Christina of Sweden to become a court philosopher in Stockholm, at a time when Sweden was still celebrating the peace of 1648. He did not find the climate hospitable in the "land of bears, with the rocks and ice" (5:349), and he died of pneumonia early the next year (11 February 1650). His followers published many of his letters (1657–67), which contained philosophical, mathematical, and scientific discussions, as well as pharmaceutical and medical advice for his friends.

RECEPTION AND INFLUENCE

Descartes drew both followers and opponents in the second half of the seventeenth century. His philosophy was condemned by the theological faculties at Louvain and Paris, by the Jesuits, and by the Augustinians of the Parisian Oratory. His works were banned from teaching even at Leiden and Utrecht, but the ban was routinely ignored by the magistrates who pronounced it, and by the numerous Cartesian professors they appointed. Despite such controversy, his name was soon added to lists of great philosophers, from which it has never disappeared. His *Discourse* and *Meditations* remain among the most widely read of all philosophical texts.

Over the centuries, opinions have changed about what is valuable and controversial in Descartes' philosophy. Such change should be expected, for the assessment of past thinkers is often influenced by current knowledge and interests.

Throughout the seventeenth century, Descartes' scientific concepts exerted the widest influence. His vision that the material world is composed of small corpuscles of homogeneous matter, and that all the properties of material things can be explained through the interaction of such corpuscles, captured the imagination of many followers. Textbooks of Cartesian physics were published, as were medical works in Cartesian physiology. His physics was taught at universities in the Dutch Netherlands, England, Sweden, and Italy, and in public lectures in France. From 1699, Cartesians were admitted to the Royal Academy of Sciences in Paris, the primary home of French scientific thought. Recall that the young Isaac Newton was reading and criticizing Descartes' *Principles* as he formed the outlook that framed his later work. Descartes' account of momentum and impact was studied in relation to the dynamic, force-based theories of Newton and Gottfried Wilhelm Leibniz. At Newton's own Cambridge, the Cartesian *Treatise on Physics* of Jacques Rohault was taught into the 1740s; in France and Germany, Cartesian physics was debated for twenty years beyond that.

Descartes' rationalist project of discerning the foundations of physics and philosophy through reason alone was disputed by other seventeenth-century philosophers, who believed that all knowledge arises through sensory experience. Among his empiricist opponents, the French atomist Pierre Gassendi shared the mechanistic conception of matter, but he held that matter is constituted from indivisible atoms as opposed to the infinitely divisible extension of Descartes, and he posited a vacuum, which Descartes deemed impossible. The Irish chemist Robert Boyle remained agnostic on atoms versus infinite divisibility (and on the vacuum), as did the philosopher John Locke (who, however, argued for the vacuum); they joined Descartes in affirming a corpuscular philosophy against the Aristotelians while rejecting his rationalism. The English philosopher Thomas Hobbes adopted corpuscular mechanism but rejected Descartes' dualism in favor of the materialist theory that thoughts are nothing but matter in motion.

Descartes' Aristotelian opponents were also empiricists of a sort, as they held that sensory experience is required for knowledge; but they held that the intellect extracts the real essences of things through sensory experience, thus differing from the other empiricists mentioned. In any case, partly as a result of Descartes' efforts and those of the new empiricists, scholastic Aristotelian philosophy was fading throughout the seventeenth century. Despite rejecting Descartes' rationalism, the new empiricists shared in his approach of examining the knower as a basis for ascertaining what can be known. This focus on the knower remained characteristic of early modern metaphysics and epistemology through the time of Immanuel Kant.

In the second half of the seventeenth century, Benedict Spinoza and Leibniz shared Descartes' rationalist approach to metaphysics but reached different metaphysical conclusions. Spinoza acknowledged only one substance, of which mind and body are aspects. Leibniz posited many individual substances, all mind-like, so that material phenomena are grounded in simple substances that perceive or represent the world from a material perspective without themselves being truly extended.

In the course of the eighteenth century, interest in the particulars of Descartes' scientific vision faded (even as the rival Newtonian mechanistic approach waxed, which made mass and force fundamental), but discussion of his skeptical arguments and his emphasis on reason over sensory experience continued. The Scottish philosopher Thomas Reid blamed Descartes for abetting the skeptical philosophies of George Berkeley and David Hume. (Whether Berkeley and Hume really were skeptics remains a matter for debate.) Reid thought that Descartes' claim to know the contents of his own mind best of all, and the related claim that the immediate objects of knowledge are "ideas" in the mind, effectively cut the mind off from the world behind a "veil of perception" (we return to Reid's charge in Ch. 10). He and others, including the empiricist Hume, rejected Descartes' claims that our intellectual ideas directly reveal things as they are in themselves.

Near the end of the eighteenth century, Kant summed up the history of philosophy as a struggle between the rationalism of

Plato and Leibniz and the empiricism of Aristotle and Locke. He believed that both positions were partly wrong and partly right. Rationalism fails because the intellect cannot in fact transcend the senses and grasp the essences of things in themselves (whether mind, matter, or God). The empiricists are right that all knowledge arises with sensory experience, but they fail to see that some knowledge – mathematical, natural scientific, and metaphysical – requires a non-empirical framework. Kant believed that principles extracted from this framework, such as the causal law, could be known to hold within sensory experience but could not be used to go beyond sensory experience (e.g., to infer the existence of a god as creator). His criticism effectively ended rationalist metaphysics.

In the nineteenth century, Descartes was viewed as a great historical philosopher who influenced both science and metaphysics. His substance dualism was rejected in favor of various substance monisms (positing only one type of substance), the most common being the dual-aspect theory that the mental and material are two aspects of one underlying substance. The English biologist Thomas Henry Huxley praised Descartes' role in the history of physiology, and particularly his view that animal bodies, including the human body, are complex machines.

In the middle of the twentieth century, three aspects of Descartes' work received the greatest attention: his skeptical arguments, his *cogito* argument, and his argument for a mind–body distinction. His new physics was largely ignored in English-language writings after mid-century, although it was known earlier and was emphasized in French and German scholarship. In the last quarter of the century, the history of philosophy underwent a renewal, so that historical texts were interpreted and evaluated on their own terms. This meant asking what past authors had considered important in their philosophy and evaluating their arguments in relation to their actual aims, rather than simply using their texts as foils for recent philosophical positions. Attention returned to Descartes' project of using metaphysics to found a new theory of nature. His doctrine of mind–body unity and his physiological and psychological theories shared equal billing with his mind–body dualism. It became widely recognized that Descartes was not a skeptic but had used skeptical arguments instrumentally, with the aim of achieving metaphysical knowledge.

READING DESCARTES TODAY

Descartes' philosophical teachings cannot be avoided, whether one agrees with them or not. The skeptical doubt, the *cogito*, and mind–body dualism continue to function as landmark positions in the geography of present-day thought. Although few now accept his substance dualism, he is often invoked in the philosophy of mind. Some admire and some disparage his realism about the mental. Others blame him for many modern ills, contending that his dualism caused thinkers to devalue the body and emotions.

In this guidebook, we want to move past stereotypes and reputation in order to look at Descartes anew. We have learned that he was an original scientist, mathematician, and metaphysician, who laid the basis for analytic geometry, published the first unified and comprehensive celestial and terrestrial physics, and proposed new theories of mind, body, and their interaction. These new theories framed Descartes' work on the philosophy and psychology of sense perception and bodily emotions. This larger picture conditions our approach to the *Meditations*.

There are many reasons for reading Descartes today. Because his positions serve as landmarks, it is useful simply to find out what he said. Moreover, the depth of his argumentation is formidable, even if one disagrees with his premises and conclusions. The *Meditations* was constructed to bring readers to see the conclusions of the arguments for themselves. For this purpose, Descartes adapted a literary form common to the seventeenth century, the meditative mode of writing. His adaptation of form to content is worthy of appreciation in its own right.

In analyzing and evaluating Descartes' text and arguments, readers gain skill in approaching texts and arguments more generally. Such skill is one main product of philosophical study, but in order to interpret the text and evaluate the arguments, we need to understand what Descartes said. To read with comprehension requires considering the intellectual context in which Descartes wrote, including the Aristotelian philosophers who were his first opponents and initial audience.

In the end, our aims are to understand and evaluate Descartes' project in relation to his context, to appreciate his

philosophical influence, and to discover what we find compelling in his work.

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In addition to the Italian innovators, Descartes knew of and mentioned most of the scientific authors cited in this chapter: F. Bacon (1:251), Copernicus (1:282), Galileo (1:270), Harvey (1:263), Kepler (*1:127*, 2:86, *4:398*), and Tycho Brahe (1:252), along with many other medical and natural philosophical authors.

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2

READING THE *MEDITATIONS*

The *Meditations* is a piece of writing. We are interested in it as philosophical writing, which means that we want to understand its conclusions, grasp its vision, and locate the source of its philosophical force. How does a work gain philosophical force? Surely this must vary depending on the aims and methods of the work, which in turn vary from thinker to thinker and age to age.

The modern standard for producing philosophical conviction is the argument. In its bare-bones structure, an argument is set out in numbered steps, called premises, which lead logically to the conclusion. A logically valid argument is such that if its premises are true and the conclusion follows logically from them, then the conclusion must be true. (On logical argument and Descartes' relation to it, see the Appendix.)

Descartes certainly used arguments, and we will examine many of them. We are interested in the logical structure of his arguments (even if, as we saw in Ch. 1, he did not consider it important to present arguments explicitly in a formally valid structure). But, no matter how flawless the logic, to establish the truth of its conclusion an argument's premises must be true. How is the truth of a premise established? Some premises might be established by

previous argument, but not all, on pain of circularity or infinite regress. Some might be accepted on the basis of sensory experience. Others might be taken as rationally self-evident.

Discovering a firm basis for his premises, or first principles, was especially important to our author. He believed that true principles, once discovered, would guide further reasoning by the clarity of their content. As modern readers looking back at Descartes' work, we should seek to understand how he endeavored to reveal such clarity to his audience. And sometimes we will reconstruct his reasoning in formally valid arguments as a way of understanding for ourselves how his principles could yield further conclusions.

In the *Meditations*, Descartes sought especially to establish new principles in metaphysics, many of which were not accepted by his philosophical contemporaries. Moreover, most of his contemporaries, as empiricists of one stripe or another, held that all knowledge arises from the senses. Descartes believed that the special premises he wished to establish, concerning the nature of reality, could not be based in sensory experience. He was faced with the difficult problem of getting a hostile audience, committed to an opposing epistemology, to see the force of his first principles. The *Meditations* was constructed to meet this challenge.

METHOD IN THE *MEDITATIONS*

In Chapter 1, we saw that Descartes listed four rules of method in his *Discourse* (6:18–19). Boiled down, these amount to (1) accepting as true only what is known so clearly and distinctly as to be beyond doubt; (2) resolving problems into the simplest parts possible; (3) moving from the simple to the complex; and (4) thoroughly reviewing and checking one's work. This is a method appropriate to a great mathematician. We have seen that, from 1619 on, Descartes sought to extend the certainty characteristic of mathematics into philosophy.

The *Meditations* uses a method of doubt to find what is indubitably known, as in rule (1). It seeks to resolve problems into basic or simple parts (2), first searching for a single indubitably known thing, then for the basic constituents of all things, and subsequently moving on to more complex knowledge (3). Finally,

it includes reviews and checks throughout (4). Descartes' method of doubt is examined more fully in Chapter 3.

Seventeenth-century thinkers were fascinated with the notion of method. They wanted to know how new knowledge can be discovered and how existing knowledge can be presented and justified to someone who doesn't already accept it. By the 1620s, before publishing a single word, Descartes was renowned for possessing a new method of discovery. We can infer that he was also interested in methods of exposition, for he used several, including autobiographical narrative in the *Discourse*, fable in *The World*, dialogue form in the *Search for Truth*, and textbook format in the *Principles*.

In crafting the *Meditations*, Descartes drew on still other methodological devices. He took the "analytic method" from mathematics, adapted the literary form of the meditation from religious writings, and used the Objections and Replies to stage his own form of scholastic disputation.

ANALYTIC METHOD

Descartes described the analytic and synthetic methods near the end of his second Replies to Objections (7:155–56). The synthetic method starts from definitions, axioms, and postulates and moves on, in an unbroken chain of demonstrations, to prove theorems. Euclid's geometry is the classic example. The reader can be compelled to assent by showing how the current step follows from what has been given. The analytic method, by contrast, takes nothing as previously given. It starts from a particular problem and works backward, as it were, until some simple and evident truths by which the problem could be proved or solved are reached. Those following the method are supposed to see the simple and evident truths for themselves as they work back. In both methods, Descartes insisted, items are demonstrated solely "from what has gone before" (7:155) – meaning that nothing is assumed that has not been explicitly introduced or shown to follow from what has been introduced. But with the synthetic method, the chain of explicit demonstrations can begin with axioms and postulates that are simply assumed or accepted on

authority. With the analytic method, the reader will become convinced only if he or she achieves appropriate insights into crucial premises, or first principles. (Descartes believed that in the analytic method he had reconstituted the secret method of discovery of the ancient Greek mathematicians [10:373].)

Descartes thought that the synthetic method, with its requirement that the definitions, axioms, and postulates receive prior acceptance, would not be effective in arguing for his new metaphysics. It was fine for elementary mathematics; the opening statements in Euclid might be sufficiently evident that they would be granted by all – or at least so widely accepted that students could feel secure in adopting them. Metaphysics was different. There, writers disagreed even on the basics (e.g., whether the natural world could exist on its own or must be created, whether matter is continuously divisible or made of finite least parts, etc.). The dominant Aristotelian metaphysics was, in Descartes' view, deeply flawed. To the extent that his readers were inculcated with an opposing but flawed metaphysics, they would resist his new principles.

For these reasons, he believed the method of analysis was needed, to lead readers to consider metaphysical first principles for themselves. But he did not claim that the method would be universally effective. For an inattentive or lazy reader, it would not compel assent, for it did not offer an unbroken chain of demonstration from previously given premises. Rather, its aim was to help the reader to retrace the path of discovery, intuitively grasping the needed principles at each step. When using the method of analysis, "if the reader is willing to follow it and attend sufficiently to all points, he understands the thing and makes it his own just as perfectly as if he had discovered it for himself" (7:155). The analytic method invites each individual to establish the merits of the proposed truths for him- or herself (see also 9B:3, on seeing for one's self).

The six Meditations were constructed to focus the reader on the required points. They use the method of doubt to clear his or her mind of previous opinions, leading to a first truth in the *cogito* argument. Its basis is then sought "analytically" (in Med. 3), by asking what could explain this indubitable knowledge. The reader then uses the discovered basis to find additional first

truths. Further reflections on this basis, as dependent on innate ideas, follow (7:51, 68).

THE *MEDITATIONS* AS MEDITATIONS

Descartes did not think that his metaphysical principles would meet resistance only because some readers already held other beliefs. Rather, he considered certain core beliefs, opposed to his metaphysics, to be the ordinary and usual result of human cognitive development. Human infants are immersed in the body (see 8A:35). They rely on their senses for preservation, and the senses normally do well. From such successes, children mistakenly believe that the senses inform them immediately not only of what is useful in external objects but also of their ultimate nature (7:83). Later on, adults forget how these early opinions were formed and unreflectively accept that bodies are composed out of the properties manifest to the senses, including colors, sounds, tastes, odors, and tactile qualities such as hot and cold (the Aristotelian "real qualities"), as well as others such as size, shape, and motion.

This description shows how childhood prejudices could lead one to become an Aristotelian philosopher. With their sense-based theory of cognition, orthodox Aristotelians held that immaterial beings such as God, since they do not fall under the senses, can be cognized only obscurely in this life. Such cognition must proceed through analogy with created things; for example, we observe that any change in sensible things requires a cause, so, by analogy, we posit a supreme cause as creator of the whole world. By contrast, Descartes (like the Neoplatonists) held that a clear and distinct idea of God could be gained only by turning away from the senses and the created material world and relying on purely intellectual contemplation.

To reach his Aristotelian audience (as also the new empiricists), Descartes needed to overcome the belief that all knowledge and thought are based in the senses. In essence, he had to retrain his readers to turn from the senses toward purely intellectual ideas. Otherwise, the analytic method of the *Meditations* would not work. To effect this retraining, he adopted a second methodical

device: he composed his work using the literary form of the meditation.

In Descartes' day, the meditative method was well developed in religious writings known as spiritual exercises. Ignatius, founder of the Jesuits, composed a set of *Spiritual Exercises* in the sixteenth century, and Descartes participated in meditations or spiritual exercises at La Flèche. Such exercises seek to train a meditator's mental faculties. Works in the genre follow a standard order. First, one retreats from the world of the senses, in order to meditate upon religious images (with Ignatius) or to clear the mind of images so as to experience union with God (with Augustine). Then one trains the will to avoid the error of sin. The exercitant sequentially focuses on the relevant cognitive faculties: first the senses, then the imagination and intellect, and finally the will.

Descartes' *Meditations* is not spiritual, but cognitive and epistemic. ("Epistemic" means having to do with knowledge and its grounds.) It aims to produce metaphysical knowledge, not to induce a religious experience (at least not primarily). In it, one turns away from the world by denying the reliability of the senses (Med. 1), clears the mind of sensory images in order to experience the mind itself and to find there the idea of God (Meds. 2–3), and seeks to regulate the will so as to avoid error in judgment (Med. 4). Once the meditator's mind has been properly trained, Descartes seeks to establish further points in his metaphysics, including his theory of material substance, his mind–body dualism, and his new theory of the senses (Meds. 5–6). Concluding remarks to the first four Meditations attest to Descartes' use of the meditative genre, when he speaks of training his will to pretend that the material world does not exist (7:22), of fixing a result in memory (7:34), of contemplating God (7:52), and of controlling the will (7:62).

OBJECTIONS AND REPLIES AS DISPUTATION

To convince the widest variety of readers of his new metaphysics, Descartes creatively adapted another form of literature. Medieval scholastic works sometimes took the form of disputations, in which the opinions of various sides, pro and con, were offered on a given topic. Disputations took place in universities at public

meetings, and they might subsequently be published. Descartes engaged in such disputations at La Flèche. As an extension of this practice, in the *Discourse* he promised to reply by letter to any objections sent to him. With the *Meditations*, he arranged for objections and replies to be published with the original work. Together with Mersenne (who chose several objectors, and composed his own objections), he distributed copies of the *Meditations* to some leading philosophers and theologians, whose objections were appended to the six Meditations with Descartes' replies.

Descartes used his Replies to Objections for various purposes. Partly, he wanted to test himself against strong objections and show that he could meet them. In a philosophical culture accustomed to disputation, that would provide powerful support. He also wanted to show that he could avoid theological difficulties, so he made sure to have theologians represented among the objectors. (He originally proposed that objections be solicited only from theologians [3:127, 183], although he had himself already shown the manuscript to a philosopher, his follower Regius at Utrecht [3:63].) Perhaps most importantly, the Replies allowed him to elaborate his positions using standard philosophical terminology and modes of argument, and to introduce additional matters (such as his doctrine on eternal truths).

OVERVIEW AND FRONT MATTER (7:1–16)

The *Meditations* consists of the opening Letter to the Faculty of Theology at the Sorbonne, a Preface to the reader, a Synopsis, the six Meditations, Objections and Replies, and (in the second edition) letters to Dinet and Clerselier. The six Meditations were written as a self-contained work, completed by March 1640. Shortly thereafter and into 1641, this work was circulated to elicit objections (first by Descartes in the Netherlands, and subsequently by Mersenne). Later in 1640, Descartes composed the "front matter," consisting of the Letter, Preface, and Synopsis.

LETTER TO THE SORBONNE (7:1–6)

In July 1640, Descartes wrote to Mersenne that, before publication, he wanted his work "seen and approved by various Doctors [of

Theology],” including “the Sorbonne as a body” (3:126–27). Indeed, he would dedicate it to the Faculty of Theology at the Sorbonne (3:184–85), the most respected theologians in France. He desired their support in a newly anticipated battle with the Jesuits (3:126), ensuing from Bourdin’s attack (3:184, 752). He wanted them to approve the work, or to provide objections for his reply (3:239–40). Four members of the faculty considered the work; their approval, in August 1641, was noted in the first edition.

Descartes’ Letter asks the Sorbonne to sponsor his book because of its (ostensible) two principal theses: the existence of God and the distinction of soul from body (allowing the soul’s immortality). Echoing the Lateran Council, these are items of religious significance that can be demonstratively proved by “natural reason” – by the human mind working on its own (7:2).

The Letter claims that the book’s arguments can convince “unbelievers” of the existence of God and the separability of the soul. Believers happily accept these tenets on the authority of the Bible and also grant the Bible its authority because it comes from God. But “this cannot be put to unbelievers because they would judge it to be circular” (7:2). Descartes has therefore examined all rational proofs for these tenets and presents the best available (7:3–4).

If he provides rational proofs, why should he seek “protection” under the “authority” of the Sorbonne? Because, by comparison with mathematical proofs, which everyone is taught to accept as uncontroversial, questions in philosophy are deemed subject to a variety of answers. Further, the basic ideas of mathematics are easily understood, whereas those of metaphysics are not. To follow Descartes’ metaphysical arguments, the reader must possess “a mind completely free from preconceived opinions and one that can easily withdraw itself from involvement with the senses” (7:4). In order to quiet readers who could not do this, Descartes would enlist institutional authority – especially against an organized group such as the Jesuits.

In Chapter 1, we saw that Descartes’ primary motivation was not to tender proofs to unbelievers; he wanted (surreptitiously) to convince his readers of the foundations of a new physics. From 1629 (1:85), he had expected the main objections from Church

authorities would be directed at his physics or natural philosophy (1:271, 285, 324, 455–56, 564) – including his account of sensory qualities and his affirmation of the Earth's motion – and not his views on God or the soul (although they were criticized too). Did he, then, include the material on God and the soul simply as a shield from criticism, in order to appease a religious age?

Some interpreters hold that Descartes cared only about his physics and merely sought prudentially to appease religious authority (in light of Galileo's condemnation). Indeed, Hiram Caton argues that Descartes was a materialist and atheist who used talk of God and immortality to camouflage his true intentions. Accordingly, when, in the Letter, Descartes mentions the circularity involving God and Scripture, he is hinting about the circularity of his own use of clear and distinct perception to prove God's existence paired with his appeal to God to underwrite the truth of clear and distinct perceptions. (This charge of circularity is discussed below.)

Despite Descartes' confession to Mersenne (3:233, 298) that he was not fully honest about his purpose in the *Meditations*, nothing indicates that he was insincere in proving God's existence and the distinctness of mind and body. Such topics were not simply matters for religious belief (or disbelief), but were part of philosophy and subject to rational scrutiny. In any case, assuming that Descartes was a religious believer, his primary philosophical aim was to establish foundations for his physics. We should expect the discussions of God and the soul to contribute to this metaphysical goal.

In thinking about these questions, it is important to distinguish specifically religious matters from philosophical discussions of God and the soul. Descartes avoided what he considered to be purely theological questions (1:153, 4:119, 5:176, 7:428), such as whether the world was created in six days (5:168–69), "mysteries" such as the Trinity (3:274), the existence of miracles (*2:557–8*, 3:214, 11:48), the role of the will in sin (7:15), and so on. In purely religious matters, he favored divine illumination through the "light of grace" over natural reason, which meant that he left such matters to revelation as interpreted by the Church or accepted by individuals (3:426, 7:147–48, 8B:353–54, 9A:208). He criticized others for mixing religion and philosophy (2:570) or

deriving philosophical truths from the Bible (2:347–48, 8B:353). Regarding God and the soul, he addressed aspects that he considered knowable by reason alone. The concept of a supreme god and the question of whether the soul is immaterial had been part of Greek philosophy, prior to the medieval synthesis of Greek thought with the Judeo-Christian–Islamic tradition. Descartes considered the notion of a supreme being to be a proper topic for "natural" reason, that is, reason independent of divine revelation. One might with hindsight suspect that his theory of God was influenced by the surrounding religious culture, but that does not alter the fact that he intended to address only those aspects of God known by reason alone. Similarly, he thought that the soul might be studied as a part of the natural world by means of reason. Indeed, for philosophical purposes, he equated soul (Latin *anima*) with mind (*mens*) and preferred the latter term (7:161, 356). He did, as needed, try to show that his philosophy was *consistent* with Catholic (and, in the Netherlands, Calvinist) doctrine (3:349, 5:544). This was prudent, for his personal safety, and the acceptance of his works by educational and political authorities depended on it. In some cases, these doctrinally consistent explanations were tortured (e.g., on bodily surfaces [7:250–51, 433–34]), but he was not prepared to change his core philosophical positions to gain acceptability (3:259). If he feared punishment, he was willing not to publish (1:271–72).

A good case can be made that Descartes needed the arguments about God and the soul to secure the foundations of his physics. Famously, he raised the possibility of a deceiving God in the First Meditation as his strongest reason for doubt, which, if answered, would yield absolutely certain knowledge. He used this hypothesis in conjunction with his analytic method to search for first principles. In the Third Meditation, he contended that the conception of finite beings, including the soul or mind, presupposes the idea of an infinite being. In physics proper, he appealed to God as the operator behind his laws of motion, acting to conserve the quantity of motion in the universe, a role foreshadowed in the Third Meditation. Further, in the seventeenth century nearly every philosopher considered the mind (whether dualistically conceived or not) to be part of nature and so to fall within the

discipline of "physics" as then conceived, to mean the study of all of nature. In examining human beings in his physics, Descartes needed to account for the mind, its relation to the body, and its role in various bodily functions, including sensation.

PREFACE TO THE READER (7:7–10)

The Preface intimates the intended breadth of Descartes' work and forestalls quick objections. The *Meditations* covers not only God and the soul but also "the foundations of the whole of First Philosophy" (7:9). The work is to provide a complete version of the metaphysical arguments only sketched in the *Discourse*. Further, it reveals *all* the "foundations" (Latin *initia*, literally, elements or first things) of metaphysics, beyond God and the soul. As he wrote to Mersenne, it examines "all the first things that one can know by philosophizing" (3:235; also 3:239).

In the Preface, Descartes addresses objections he had received to the *Discourse*. The argument for mind–body distinction in that work has every appearance of being fallacious. Descartes claims that the earlier work provided only a truncated version of an argument that he would now present in full. A second objection, concerning the argument for God's existence, allows Descartes to introduce his distinction between an idea of God considered simply as a state of mind and the content of that idea – a distinction crucial to the argument of the Third Meditation. He dismisses other objections as "lifted from the standard sources of the atheists" (7:8–9).

Perhaps to forestall new objections, he repeats a point from the Letter. Modestly predicting that the new, deeper, more complete arguments of the *Meditations* would not gain a wide audience (although in fact he was already recasting them in textbook form), he warns the casual reader: "I am not an author for anyone who might read this book except those who are willing and able to meditate seriously with me and to draw their minds away from the senses and, at the same time, all preconceived opinions" (7:9). Readers should attend to the order and connection of his arguments without dwelling on individual sentences. The *Meditations* presents the "very thoughts" by which he arrived at the truth, to

see whether others would find them convincing (7:10). Those not convinced should examine the Objections and Replies, where he has perhaps responded to every serious objection that can be raised. (Although not foretelling every serious objection, they do record many of the important problems with Descartes' arguments.)

SYNOPSIS (7:12–16)

In December 1640, Descartes sent Mersenne an "abstract" or "synopsis" of the *Meditations* (3:272), summarizing the six Meditations and addressing queries from Mersenne.

Mersenne had inquired why the proof for mind–body distinctness had to wait until the Sixth Meditation, and why there was no proof of immortality (3:266). (The *Discourse* had hinted at such a proof [6:59–60].) The Synopsis explains (7:13) that the proof of mind–body distinctness depends on knowing that clear and distinct perceptions are true (Med. 4) and discovering the nature of corporeal things (Meds. 2, 5, 6).

As for immortality, by proving the soul is distinct from the body and so need not perish with it, Descartes allows for everlasting life without proving it. A proper proof would have to explain how a human body can perish by losing its configuration, even though matter (or body in general) cannot perish (subject to God's preservation, as described in Med. 3); and how a human mind, because it is a "pure substance," preserves its identity across all changes of its "accidents" (properties that may change from moment to moment) and so does not perish (7:14).

Otherwise, the Synopsis summarizes "the principal points concerning God and the soul" (3:268), including the use of skeptical doubt in coming to understand intellectual (immaterial) beings (7:12, 14). The Synopsis was to help certify Descartes' religious orthodoxy.

THE MEDITATIONS PROPER (7:17–90)

Although Descartes described the six Meditations as a "treatise" to Mersenne and in the Letter (3:183, 7:4), we have seen that it was not structured as an ordinary philosophical treatise, in which

an author directly presents arguments and discoveries. It was written as meditations. He explains in the Second Replies that he wrote "Meditations" – rather than "Disputations," or "Theorems and Problems" as in mathematics – because of his desire to follow the analytic method (7:157). This choice of genre carries implications for our interpretation of the first-person voice (signaled in English with the pronoun "I") in the six Meditations themselves.

FIRST PERSON IN THE *MEDITATIONS*

In the front matter and the Replies, the first person clearly refers to René Descartes, author of the work – although the Synopsis has many impersonal sentences. In the body of the work, the first-person referent is less obvious. The work ostensibly describes a sequence of thoughts that Descartes has had, characterized in the Preface as "the very thoughts" that yielded the metaphysical truths he now presents (7:10). However, the six Meditations certainly do not record Descartes' thoughts over a few days in his stove-heated room (in 1619), since he came to his metaphysics only nine years later. Moreover, when he wrote the *Meditations*, he did not actually believe some of what the First Meditation affirms, such as that, up to that instant, he held the senses to be the primary basis of knowledge (7:18). When writing the first part, he had already formulated the quite different attitude toward the senses found later in the work.

The *Meditations*, unlike the *Discourse*, is not properly autobiographical. How then shall we understand the "I"? We may view the six Meditations as a story that Descartes has constructed in the first person to represent, in the fictional setting of six "days" of meditating, the sequence of thoughts by which he had discovered his metaphysics (autobiography with literary license) – or at least a sequence of thoughts that, in accordance with the analytic method, would show how the discovery can be made. Accordingly, the "I" of the six Meditations functions as a fictionalized narrator and protagonist in a metaphysical morality play, together with God and the malign demon. The reader "takes the moral" of the story through empathy with the narrator.

This construal properly distinguishes the fictionalized "I" of the six Meditations from Descartes, their author. It also permits the "I" to serve as a placeholder for every reader, an intention signaled by occasional use of the first-person plural ("we say," "let us," etc. [7:21, 30, 32]). Descartes presumably constructed his narrative by imagining the "I" as an Aristotelian scholastic or an educated man of good sense (likely to be a natural empiricist), as in the *Search for Truth* (see Ch. 1). Even so, readers in later periods may be able to take up the story.

Still, this construal does not fully capture the active approach that the reader is to take in assuming the role of the "I." When Descartes asks only for readers who will "meditate seriously" with him (Preface, 7:9), he is instructing the reader to approach his metaphysical meditations like religious exercises – as a guide to achieving experiences that each must have for him- or herself. As readers, we are to place ourselves in the position of the meditator and engage with the arguments and exercises fully and directly, undergoing, as much as possible, a cognitive progression so as to grasp the things that Descartes has already discovered. The reader must not simply follow a narrative in his or her imagination but must seek to relive the process of doubt and discovery, not merely reading about various cognitive acts but performing them. Enacting the story, the meditator often declares in present tense that she is undertaking such acts (7:30, "I put the wax by the fire"), or vows to do so in the near future (7:34, "I will now shut my eyes").

When naming the "I" in Part II, I often speak of "the meditator," rather than of Descartes as author. (For distinctness of reference, we can imagine the meditator as female; of course, any individual undertaking the exercises should assume the role of the "I" themselves.) Nonetheless, as author, Descartes constructed the work's exercises and arguments with didactic aims. Hence, in describing the philosophical strategy behind various arguments or devices, I invoke Descartes, not the meditator. As the work progresses, the meditator's conclusions come to express Descartes' own metaphysical positions. By the end, the distance between Descartes' philosophical position and that of the meditator should diminish to nothing.

OVERVIEW OF THE METAPHYSICAL TREATISE

The individual Meditations are of various lengths, the first being the shortest, the sixth the longest. A rough idea of their contents, and hence of the order of Descartes' argument, can be gleaned from their titles (Table 2.1). Descartes begins by having the meditator engage in a process of doubt (Med. 1). She finds that the existence and nature of her own mind are better known to her

Table 2.1 Topical analysis of the *Meditations*

Med.	Title	Epistemological topics	Metaphysical topics
1	What can be called into doubt	Sensory fallibility Mathematics dubitable	
2	The nature of the human mind, and how it is better known than body	Indubitable "I" (*cogito*) Mind cannot be imaged Knowledge of body via intellect	Nature of thinking thing Body as extension
3	The existence of God	Truth rule: clear and distinct perceptions are true Natural light vs. teachings of nature Idea of God innate God is no deceiver	Causal principle Metaphysics of ideas God's existence and attributes Preliminary distinction between geometrical and other sensory qualities
4	Truth and falsity	Analysis of judgment: intellect and will Analysis of cognitive error Reaffirmation of truth rule (God is no deceiver)	Cognitive error and the problem of evil Freedom of the will
5	The essence of material things, and the existence of God considered a second time	Innate ideas of essences Knowledge of God needed to banish doubt	Essence of matter is extension Ontological argument for God's existence

Table 2.1 (continued)

Med.	Title	Epistemological topics	Metaphysical topics
6	The existence of material things, and the real distinction between mind and body	Intellect vs. imagination Role of senses and intellect in knowing bodies Analysis of sensory error	Mind as distinct substance, with intellectual essence External objects exist Mind-body union Status of sensory qualities Psychophysiological correlations

than are material things (2). She then considers two proofs for the existence of God (3), learns to guide her judgment so as to find truth and avoid falsity (4), considers the essence of material things and another proof of God's existence (5), and discovers a real distinction between mind and body and proves the existence of material things (6).

The sequence of topics expressed in the Meditations' titles does not fully describe the main arguments and conclusions of the work. The titles of Meditation 2, and perhaps 3, 5, and 6, reached their final form late in the process of composition, after the first three sets of objections were in hand (3:297). They herald his results concerning God and the soul. But they do not articulate the contents of the work as a treatise on general metaphysics, undertaken to establish something "firm and lasting" in the sciences (7:17). Nor do they draw attention to the main methodological and epistemological moments, as the meditator battles back from the radical doubt of Meditation 1. Table 2.1 summarizes these further topics under two headings.

FURTHER TOPICS: METHODOLOGICAL AND EPISTEMOLOGICAL

In a work ostensibly intended to demonstrate some truths about God and the soul, the author might choose not to highlight his

methods. Accordingly, other than asking his readers to concentrate (in the Preface), Descartes might be expected not to discuss his method much up front. (In fact, the most extensive discussions occur in the Replies to Objections.)

Nonetheless, we have seen that he thought carefully about the methodological structure of his work, and in fact points about method are scattered throughout. In the First Meditation, he characterizes the work as having an epistemological aim. It will seek to evaluate and undermine the foundations of the meditator's previous claims to knowledge and find new foundations (7:17). From these comments and the Synopsis, the meditator can know that the whole work is aimed at achieving certain knowledge. Furthermore, the Synopsis apprises her that a specific rule for gaining such knowledge, involving the truth of "clear and distinct perception," is in store.

The First Meditation employs the celebrated method of doubt. The meditator is instructed to doubt all her previous beliefs. To achieve this aim, she is offered various arguments to undermine the sources of her previous knowledge. She casts doubt on the senses and comes to doubt the existence of the material world by means of the deceiving-God hypothesis. She uses the latter hypothesis even to doubt the "transparent" truths of mathematics (7:20–21).

Descartes did not employ his method of doubt as part of a generally skeptical outlook. He used it as a tool to induce the meditator toward knowledge that he foresaw she would obtain. He expects his readers to be unacquainted with the type of knowledge in question – perceptions of the pure intellect – and so he uses the doubt to focus attention on how such knowledge can be achieved. Famously, his first result concerns the meditator's own existence as a thinking thing, achieved through the *cogito* reasoning. This first result serves as a basis for subsequent knowledge. How it does so requires interpretation, and we consider several possibilities in Chapter 4. But one way the *cogito* helps – as the meditator observes in Meditation 3 (7:35) – is by providing an example of what it takes to know anything. The meditator can then work backward, in accordance with the method of analysis, to find its underlying basis.

In this way, Descartes leads the meditator to extract his famous rule: that clear and distinct perceptions are true. Although first asserted early in the Third Meditation, the Synopsis says that the rule is fully established only in the Fourth (7:12, 14). And, indeed, much of the Third Meditation concerns whether the hypothesis of a deceiving God, which at least seems to call the rule into question, can be removed. The use of the rule to reject the deceiving-God hypothesis led some readers to charge Descartes with circular reasoning. We should pay close attention to whether Descartes needed to provide – and, if so, how he might have provided – further support for his truth rule beyond the argument at the beginning of Meditation 3. One candidate for validating the rule would be for a nondeceiving God to provide a guarantee for it. But appeal to such a guarantee leads to the charge of circularity.

Descartes frames the epistemology and methodology of the six Meditations in the vocabulary of cognitive faculties. He speaks freely of such faculties, including the senses, imagination, memory, and intellect or reason. In analyzing acts of judgment in Meditations 3 and 4, he adds the will as a separate mental faculty. All six Meditations contain points about the operation, reliability, and comparative roles of various mental faculties. Discussion of such faculties had been found in philosophical analyses of knowledge since antiquity. Descartes could expect his readers to understand his terminology. Readers today may be less familiar with this sort of talk. Nonetheless, Descartes' attention to cognitive faculties helped initiate a focus in early modern philosophy on the characteristics of the knowing subject, a focus found through the time of Kant.

Part of Descartes' epistemological project was to convince the Aristotelians and new empiricists that their theories of how the cognitive faculties function to yield knowledge were erroneous. As mentioned, Aristotelians and empiricists held that sensory materials are required in every cognitive act. But Descartes maintained that some acts of cognition – indeed, those that hold the key to metaphysical knowledge – occur through the intellect alone.

His disagreement with the Aristotelians and new empiricists hinged on his claim that the "pure intellect" operates independently

of the senses and imagination. In the terminology of mental faculties, "imagination" has a technical meaning. To imagine something is to form an image of it, as when, with eyes closed, we think of our pet cat by picturing to ourselves what he looks like. Such images are concrete. They show the cat in some particular position, usually in relation to a surface (on a favorite perch, or on the floor crying to be fed), perhaps with eyes open or closed, tail in the air or tucked next to the body, and so on. Although many thoughts involve such images, Descartes contended that other thoughts contain no images at all. These are the perceptions of the pure intellect, which extend to God, the mind as a substance, and geometrical essences. The distinction between imagination and pure intellect, discussed at length in the Sixth Meditation (7:71–73), was fundamental to Descartes' epistemology, as interchanges with Hobbes and Gassendi in the Objections and Replies make clear (7:178, 181, 183, 358, 365, 385).

A final aim of Descartes' epistemological program was to re-evaluate the role of the senses in knowledge. The Sixth Meditation rehabilitates the senses, but with a different role in philosophical knowledge than was mentioned in the First. The primary function of the senses is to detect potential bodily benefits and harms in the surrounding environment. They are not for discovering the essences of natural things; that function belongs to the intellect alone. But the senses can provide knowledge beyond the locally pragmatic. In natural philosophy, they help to ascertain facts about the material world, such as the true size of the Sun (7:80).

FURTHER TOPICS: METAPHYSICAL RESULTS

Although Descartes was famous for his early interest in method, from 1629 his main interest in pure philosophy lay in metaphysics. The metaphysical results of the *Meditations* are the desired fruits of his method. As he advertised to the Sorbonne, some main results concern God, the soul or mind, and its distinction from body. These depend on further metaphysical concepts and principles, introduced as needed. They hold further implications for the whole human being (composed of mind and body) and the

ontology of sensory qualities. ("Ontology" is the study of the nature of "being," that is, what exists or has reality; the ontology of sensory qualities concerns how such qualities exist in objects and in our perceptions of objects.)

The main arguments concerning God occur in Meditations 3 and 5. Descartes offers three proofs for God's existence and fills out the metaphysics of God with attributes such as infinity, independence, omniscience, and omnipotence. He seeks to establish metaphysically that God is the creator and preserver of everything (7:45). We examine these arguments, and the attendant metaphysical concepts, in Chapters 5 and 7.

The Fourth Meditation asks how a perfect God could create anything evil or subject to fault. The answer relies on the Neoplatonic (Augustinian) metaphysics of good and evil. Echoing the Neoplatonic idea that being is intrinsically good, Descartes appeals to a hierarchy of being and goodness. God's infinity means that he is a complete or perfect being and so is infinitely good. Everything else is finite and so in some way falls short of perfection. Evil is not a low form of being, but a lack of being. In this sense, evil literally has no existence (no "being"); it is a lack of perfection and goodness. Descartes uses this Augustinian analysis to explain how a perfect God could create imperfect humans. As part of this explanation, he analyzes the notion of free will in humans. In making us free, God allowed us to make our own errors. Here we find Descartes using tenets from theological metaphysics to further his own project.

The metaphysical arguments concerning God, prominent in Meditations 3–5, support the final metaphysical results of the work, concerning the essences of mind and body, the relations of mind and body in the whole human being, and the proper understanding of matter and its sensory qualities. These topics are taken up in Meditations 2–5 and form the entire subject matter of Meditation 6. Early results include awareness of the mind as a unified thinking thing and formulation of a metaphysics of ideas. A key conclusion is that the essence of matter is extension – a finding with strong implications for Descartes' physics (examined in Ch. 9). Another is that the mind is an "intellectual substance" (7:78), the essence of which is thinking.

The title of the Sixth Meditation announces the "real distinction" between mind and body and promises a proof for the existence of bodies. In fact, the Meditation is largely devoted to mind–body union and interaction, and the theory of the senses. It investigates the embodied mind, including the functions of sensation and appetite (7:75–77, 80–81, 83–89), and it allots nearly equal space to the metaphysics of the sensory qualities (7:74–77, 82–83). Some of this material belongs as much to natural philosophy as to metaphysics, such as the long discussion of how the nerves produce sensations. Several points appeal to sensory evidence (7:80, 86, 87). Although these discussions are framed by the metaphysical thesis that mind and body are different kinds of substance, the discussions of sensory and nervous function mark a transition from metaphysical foundations for physics to some first results in natural philosophy itself.

OBJECTIONS AND REPLIES (7:91–561)

When Descartes had completed the body of the *Meditations*, he showed it to some philosophical allies in the Dutch Netherlands, including his follower Regius, and to a Catholic theologian named Johannes Caterus. Regius corrected the punctuation and spelling and sent several objections, which Descartes answered brusquely by return letter (3:63–65). He placed Caterus' objections at the end of his manuscript, with his own replies. In November 1640, he sent the six Meditations, Letter (and probably the Preface), and these first Objections and Replies to Mersenne, followed by the Synopsis (3:238–39, 271).

Mersenne collected the remaining objections by circulating the material to philosophers and theologians in France. Completed objections and replies were included in the manuscript sent to further objectors. (Explicit or tacit references among the Objections and Replies may be found at 7:127, 200, 208–11, 213, 348, 414, 417.) The first six Objections and Replies appeared in the first edition, published late in 1641 in Paris under Mersenne's supervision. The seventh set, by the Jesuit Bourdin, appeared in the second edition (Amsterdam, 1642) with a letter from Descartes to Father Dinet (7:563–603), head of the French Jesuits.

Descartes himself oversaw publication of the second edition (3:448).

The objectors represented innovative as well as conservative viewpoints. The innovators included the English materialist Hobbes, who moved to France in 1640 (third set), the French priest and Epicurean philosopher Gassendi (fifth set), and Mersenne himself (who contributed to the second and sixth sets, along with some theologians, philosophers, and geometers). The theological objectors included, besides Caterus and Mersenne's helpers, the French Catholic theologian Antoine Arnauld (fourth set). The most conservative objector was Bourdin. In 1644, Gassendi published the Fifth Objections and Replies separately, along with new *Counter-Objections*. Descartes responded with a Note and a Letter (9A:198–217), published with Clerselier's French translation of the Objections and Replies in 1647 (the body of the work was translated by the Duke of Luynes).

Despite their differing viewpoints and emphases, there were some topics to which all objectors responded. All save Bourdin raised questions about the proofs for the existence of God, and all questioned the proof of mind–body distinctness. Hobbes and Gassendi contended that organized matter might think; the second, fourth, and sixth objectors, although not accepting that hypothesis, challenged Descartes' success in defeating it (7:122, 198, 422). Caterus and Bourdin posed general objections to the argument for a real distinction (7:100, 503–9).

The Objections and Replies stand outside the meditational form of the six Meditations. They provide commentary and disputation that illuminate and extend the original text, and they introduce Descartes' doctrine that the eternal truths are God's free creations (7:380, 432, 435–36; discussed in Ch. 9). Their explications of technical vocabulary are especially useful. The concept of substance, mentioned sparingly in the Synopsis and six Meditations (7:14, 40, 44–45, 78–79), is explained more fully in the Second and Third Replies (7:161, 176) and elaborated using the notion of a "complete" being, or something capable of existing on its own, in the First and Fourth Replies (7:120–21, 219–31). The second, third, fifth, and seventh sets explain the methodological use of skepticism and doubt (7:129–30, 144–46, 171–72, 257–58,

454–82). As requested by the second set of objectors, Descartes appended to the Second Replies the Geometrical Arguments (7:160–70), restating his main metaphysical proofs in geometrical fashion, with definitions, axioms, and postulates.

FOLLOWING THE ARGUMENT

Part II of this guidebook considers the arguments and conclusions of the six Meditations, examined one by one. Descartes has warned that the arguments should not be evaluated in isolation, since their order and connection are crucial. Having reviewed the main conclusions, we can be mindful of where the arguments are headed.

Readers disagree about the overall point of Descartes' enterprise and the significance and role of each argument. What shall we think of a work that has been studied for several hundred years with no final agreement on its structure and purpose? Interpretive uncertainty is usual with great texts. A good strategy for a first-time reader is to attend to the overall purpose and structure of the text while remaining open to a variety of interpretive hypotheses. As you consider or even form such hypotheses, you should also note objections against Descartes' arguments so construed. Then read his work again, looking for support for one or another interpretation, and checking to see if the objections hold up. Great philosophical texts repay such effort with increased insight and understanding, and Descartes' works are no exception.

THE PRINCIPLE OF CHARITY

Philosophers sometimes appeal to a "principle of charity" for reading philosophical texts. According to the principle, one avoids attributing silly mistakes to authors such as Descartes and interprets their works so as to make "good philosophical sense." The latter phrase means finding readings of the text that render its statements mutually consistent and provide a coherent and forceful interpretation of the arguments. Sometimes such interpretations have the aim of attributing points that we agree with now or that render the text the most interesting.

How far shall we follow this principle? A good way. For instance, although it is possible that Descartes made mistakes in reasoning or contradicted himself, overly hasty attributions of contradictions or weak arguments may simply reveal our own limitations and ineptitude. The principle of charity advises us not to take the easy way out by quickly deciding that a text is incoherent or contains deplorably weak arguments. When philosophers contradict themselves, such contradictions are often deep – they reveal fundamental tensions in a philosopher's systematic enterprise. We might miss these deeper points by abandoning our interpretive effort too soon. Furthermore, some metaphysical arguments may appear weak to us now because of advances in science since they were written, or because the prevailing attitude toward religious belief has changed. But if we dismiss such arguments out of hand simply because we disagree with their conclusions, we lose any chance of evaluating their strength.

Still, the principle of charity can be taken too far. By interpreting past arguments so as to maximize their agreement with current wisdom, we run the risk of repeatedly reading our own favorite positions into past texts. Moreover, while we should seek coherent and forceful readings because they are of greater philosophical interest, this does not require that past authors always come out "right." If we always see only "correct" positions in past texts, we mask genuine differences between now and then and fail to appreciate how the problem space of philosophy has changed. A coherent argument for a position we now consider wrong can nonetheless inform us about philosophical positions and arguments and their forcefulness. The strong principle of charity, which has us always read past philosophers as saying things we want to say now, is restrictive and distorting.

READING CONTEXTUALLY

The strategy of reading past philosophers in their historical and philosophical context affords a further standard for assessing their arguments. Philosophy typically addresses problems and topics of importance in its time, including an audience of philosophers who evince the assumptions and convictions of that time. In order

to understand why philosophers construct their arguments in a certain way, we usually need to know which positions they intend to overturn and the assumptions shared by author and opponent. Such knowledge may help us see how an argument that we now reject could have seemed forceful in the past.

Philosophy attempts to get at the fundamental issues in the intellectual pursuits of a given age. Although these issues change over time, in some ways they remain the same. Questions about the possibility of knowledge, the rational grounds for thinking that a supreme being exists, and the place of mind in nature have been asked since the time of the ancient Greeks. The common assumptions and the range of plausible positions change from age to age, even while some things stay (nearly) the same. We want to notice both similarities and differences between our ways of thinking and Descartes', thereby appreciating more fully both our framework of thought and his.

INTERPRETIVE THREADS

Since its publication, the *Meditations* has been subject to many interpretations. We can recognize three main approaches in recent years: epistemological, metaphysical, and cognitive.

EPISTEMOLOGICAL READINGS

Some read the *Meditations* primarily as a work in epistemology. Accordingly, Descartes wanted to determine the possibility and limits of knowledge, considered generally, and to discover any certainties. He found that immediate knowledge is limited to our own mental states. His problem was to move beyond those states to know anything else. As a pure epistemologist, he would remain indifferent to the outcome and ready to abandon claims to extramental knowledge if his investigation reached that conclusion.

Descartes' use of the method of doubt and his emphasis on certainty are consistent with such a reading. For that reason, we should attend to his statements about the basis of knowledge and its limits. At the same time, we have strong evidence that Descartes did not write his book simply to discover whether knowledge is

possible. From the start, he conceived the *Meditations* as the first full presentation of his metaphysics. He was not simply asking *whether* anything can be known but aimed to show *how* knowledge is possible and to *prove* his metaphysical first principles.

METAPHYSICAL READINGS

Metaphysical readings acknowledge these goals and focus on Descartes' metaphysical results, including the *cogito* conclusion and arguments concerning the existence and essence of God, the essences of matter and mind, the mind–body relation, and the nature of sensory perception. On this view, Descartes examined the scope and limits of knowledge in order to show that his metaphysical findings are unshakeable. The method of doubt is simply a filter for certainty.

A COGNITIVE AND METAPHYSICAL READING

A third type of reading, favored here, joins Descartes' theory of knowledge – or, better, his theory of the cognitive faculties – with his quest for a new metaphysics. Descartes aimed to bring his readers to an awareness of cognitive resources latent in their own minds, which they could then use to see the first principles of metaphysics for themselves. In so doing, he focused attention on the investigation of the cognitive capacities of the knower qua knower.

As we have seen, the *Meditations* frequently mentions various cognitive faculties or powers of mind, including the senses, imagination, memory, intellect, and will. For much of the twentieth century, such talk was considered illegitimate and unsuited to a "charitable" interpretation of an author such as Descartes. This supposed illegitimacy frequently was expressed through a joke from the seventeenth-century playwright Molière about a Doctor who explains that opium puts people to sleep because of its "dormitive" or sleep-inducing virtue. The joke depends on the idea that it is empty and pointless to *explain* the ability to induce sleep by positing a sleep-inducing ability. However, Descartes (and others) did not seek to explain human intellectual ability by

saying that the intellect has the faculty of intellection. Faculty terms were classificatory. Intellect, will, memory, etc., are identifiable kinds of mental activity, each with its own characteristics, which are subject to further description and classification (1:366).

By taking seriously the faculty talk in the *Meditations*, we can see that the epistemological parts of the work aim to reveal significant facts about the mind's cognitive faculties. Descartes was especially interested in the senses and pure intellect. The Aristotelians assigned the intellect an important function in knowledge, of discerning "universal" or common natures, shared by all instances of a natural kind (e.g., the common nature that makes each horse a horse). But the Aristotelian intellect always must operate on an image (also known as a "phantasm") originating in the senses. Because Descartes' claim that the intellect can operate independently of the senses was antithetical to the Aristotelians, he worked hard to convince them of it. Meditations 2–6 all emphasize the discovery and proper use of the pure intellect, with the method of doubt preparing for and aiding this discovery (see 7:130–31). Once the meditator becomes accustomed to clear and distinct intellectual perception, metaphysical conclusions fall fast and thick in Meditations 3–6. On this reading, Descartes seeks to reform the theory of cognition in preparation for discovering and defending a new metaphysics.

SPECIFIC QUESTIONS, ALTERNATIVE PATHS

Beyond such large questions about overall aim, others arise about specific arguments and conclusions. We sometimes consider competing construals of arguments as we go forward, and readers should ask which is most philosophically compelling while also fitting Descartes' text.

One important question concerns consciousness in Descartes' theory of mind. The *cogito* argument in the Second Meditation focuses attention on the conscious thoughts of the meditator. Elsewhere, Descartes affirms that every act of thinking possesses consciousness (7:246). But in the Third Meditation he emphasizes the representational character of thought, and in several places he characterizes the mind as an intellectual (or perceiving)

substance (e.g., 7:12, 78). This raises the question (addressed in Chs. 4 and 8) of which, if either, is more fundamental in Descartes' conception of thought: consciousness, or intellection and representation.

Another decisive interpretive question concerns the problem of the "Cartesian circle," first raised by Arnauld (7:214). Descartes apparently appeals to God's existence and perfection to legitimize the criterion of clear and distinct perception, and he uses that very criterion to prove the existence and perfection of God. This procedure seems circular, in that a specific criterion of truth is used in an argument that legitimizes that criterion. Given the centrality of the criterion of clear and distinct perception in establishing Descartes' metaphysical results, this charge of circularity is potentially devastating.

Chapters 5–7 consider several approaches to the circle. For now, I illustrate the sorts of interpretive choice open to readers by mentioning two approaches yielding different conclusions about circularity. On one reading, Descartes does not use an appeal to God to legitimize clear and distinct perception itself. Rather, he achieves his initial confidence in clear and distinct perception by reflecting on the *cogito* reasoning at the beginning of the Third Meditation. He then uses such perception to investigate and remove the hypothesis of the deceiving God, left over from the First Meditation, by establishing that God is no deceiver. Hopefully, because God is not used to vindicate the criterion itself, the circle can be avoided.

On another reading, Descartes wants or needs to prove that the mind is properly attuned to a mind-independent reality. He calls upon God, as creator of both the human intellect and the natures of things, to guarantee that the intellect is attuned to those natures. This divine guarantee underwrites the claims of transcendent metaphysics to know the natures of things as they are in themselves. This reading has trouble avoiding the circle. Following a strong principle of charity, we might reject it out of hand. But we will not. Our approach considers Descartes' successes and his failures. If we reject the charge of circularity, it will not be through charity. It will require a reading that makes good philosophical sense contextually and fits the text.

BE ACTIVE WHEN READING

One of the most satisfying aspects of reading good philosophy is the joy of working out your own view of what is good and what is important in a particular work. I suggest that you use this guidebook and the hints it contains to come to your own reading of the text. As you formulate this reading, consider how you would convince someone with a different reading that yours is a good one. In the end, whether you agree with Descartes or not, in reading his text you will raise new questions for yourself, and consider new answers, on such topics as the nature of mind and body and the possibility of metaphysical knowledge.

REFERENCES AND FURTHER READING

Introductory works aimed primarily at Descartes' *Meditations* include Georges Dicker, *Descartes: An Analytical and Historical Introduction*, 2nd ed. (New York: Oxford University Press, 2013), Anthony Kenny, *Descartes: A Study of His Philosophy* (New York: Random House, 1968), and Catherine Wilson, *Descartes' Meditations: An Introduction* (Cambridge: Cambridge University Press, 2003). Dicker offers an epistemological and metaphysical reading, Kenny a metaphysical one, and Wilson a cognitive and metaphysical one. Kurt Brandhorst, *Descartes' Meditations on First Philosophy* (Bloomington: Indiana University Press, 2010), offers what may be termed a spiritual and phenomenological reading.

Advanced works by Martial Guèroult, *Descartes' Philosophy Interpreted According to the Order of Reasons*, 2 vols. (Minneapolis: University of Minnesota Press, 1984–85), Margaret D. Wilson, *Descartes* (London: Routledge & Kegan Paul, 1978), and Jorge Secada, *Cartesian Metaphysics: The Late Scholastic Origins of Modern Philosophy* (Cambridge: Cambridge University Press, 2000), provide metaphysical readings. Edwin Curley, *Descartes against the Skeptics* (Cambridge: Harvard University Press, 1978), offers a cognitive and metaphysical reading, as does David Cunning, *Argument and Persuasion in Descartes' Meditations* (Oxford: Oxford University Press, 2010). John Carriero, *Between Two Worlds: A Reading of Descartes's Meditations* (Princeton: Princeton University

Press, 2009), gives a cognitive, metaphysical, and theological reading, emphasizing Descartes' relation to the Aristotelianism of Aquinas. Additional epistemological readings are cited in Chapters 3 and 4.

Amèlie Rorty (ed.), *Essays on Descartes' Meditations* (Berkeley: University of California Press, 1986), covers many topics. The first three essays consider the meditative mode: Rorty discusses it as ascentional, penitential, and analytic; Kosman examines the relation between Descartes as author and the meditator as narrator; and Hatfield places Descartes' mode in an Augustinian context. Dennis Sepper considers "The Texture of Thought: Why Descartes' *Meditationes* Is Meditational, and Why It Matters," in Stephen Gaukroger, John Schuster, and John Sutton (eds.), *Descartes' Natural Philosophy* (London: Routledge, 2000), 736–50. Many interpreters now accept the importance of the meditative mode. Christia Mercer elaborates the Augustinian and other contexts for Descartes' method and his meditative mode in "The Methodology of the *Meditations*: Tradition and Innovation," in David Cunning (ed.), *The Cambridge Companion to Descartes' Meditations* (Cambridge: Cambridge University Press, 2014). Jorge Secada builds on the meditative mode in "God and Meditation in Descartes' *Meditations on First Philosophy*," in Karen Detlefsen (ed.), *Descartes' Meditations: A Critical Guide* (Cambridge: Cambridge University Press, 2013), 200–25. Some interpreters question its importance and contend that, philosophically, the "I" of the *Meditations* must be Descartes; e.g., Thomas M. Lennon, *The Plain Truth: Descartes, Huet, and Skepticism* (Leiden: Brill, 2008), ch. 8. Finally, note that in Latin the first-person voice need not be expressed through a separate pronoun, but may be included in the verb form; nonetheless, Descartes used the Latin first-person pronoun "*ego*" more than thirty times in the six Meditations.

Gaukroger, *Descartes' Meditations*, collects chapters on central topics and includes a seventeenth-century translation of the six Meditations by William Molyneux. Roger Ariew and Marjorie Grene (eds.), *Descartes and His Contemporaries: Meditations, Objections, and Replies* (Chicago: University of Chicago Press, 1995), systematically examines the objections and replies. On Descartes' alleged atheism, see Hiram Caton, *The Origin of Subjectivity: An Essay on*

Descartes (New Haven: Yale University Press, 1973). On God and religion in Descartes, see J. Cottingham, "The Role of God in Descartes's Philosophy," in Carriero and Broughton, 288–301.

Works examining method in Descartes include L. J. Beck, *Metaphysics of Descartes: A Study of the Meditations* (Oxford: Clarendon Press, 1965) and *Method of Descartes: A Study of the Regulae* (Oxford: Clarendon Press, 1952), D. E. Flage and C. A. Bonnen, *Descartes and Method: A Search for a Method in Meditations* (London: Routledge, 1999), and Janet Broughton, *Descartes's Method of Doubt* (Princeton: Princeton University Press, 2002). M. Miles, *Insight and Inference: Descartes's Founding Principle and Modern Philosophy* (Toronto: University of Toronto Press, 1999), examines method from the perspective that Descartes' philosophy focused on the soul and God and only secondarily on the new science.

For the mainstream scholastic Aristotelian doctrine that all thought requires an image, see Thomas Aquinas, *Summa theologiae* (London: Blackfriars, 1964–81), Part 1, question 84, articles 7–8; on the doctrines that God's essence cannot be known by natural human cognition because all thought is based in the senses, and that his existence and role as creator can be thought of only through analogy, see Part 1, question 12, articles 11–12, and question 13. These passages are in A. C. Pegis (ed.), *Introduction to Saint Thomas Aquinas* (New York: Modern Library, 1948).

On the methods and uses of the history of philosophy, see Richard Rorty, J. B. Schneewind, and Quentin Skinner (eds.), *Philosophy in History: Essays on the Historiography of Philosophy* (Cambridge: Cambridge University Press, 1984), A. J. Holland (ed.), *Philosophy, Its History and Historiography* (Dordrecht: Reidel, 1985), Tom Sorell and G. A. J. Rogers (eds.), *Analytic Philosophy and History of Philosophy* (Oxford: Oxford University Press, 2005), and Mogens Lærke, Justin E. H. Smith, and Eric Schliesser (eds.), *Philosophy and Its History: Aims and Methods in the Study of Early Modern Philosophy* (Oxford: Oxford University Press, 2013).

Part II

THE ARGUMENTS OF THE SIX MEDITATIONS

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3

WITHDRAWING THE MIND FROM THE SENSES

MEDITATION 1: WHAT CAN BE CALLED INTO DOUBT

The First Meditation presents Descartes' famous and much discussed skeptical arguments. The skeptical tradition had been revived in the previous century and was on the minds of Paris intellectuals in the mid-1620s. Descartes' close friend Mersenne published a mitigated – that is, partially concessive – response to skepticism in 1625, while Descartes was in Paris. Descartes himself mentions ancient skepticism (7:130) and new skeptical discussions (7:548).

In the Objections and Replies, Descartes wrote as if his skeptical arguments were simply repeated from the ancients (7:130, 171), and indeed his initial challenges to the accuracy of the senses echo traditional arguments. But in letters from the 1630s (1:350, 560), Descartes indicated that his Latin metaphysics would contain a radical form of skepticism that he did not dare publish in the French *Discourse*. This radical skepticism, or "radical doubt," challenges knowledge of the external world generally, the existence of

that world, and the truths of mathematics. To support these challenges, Descartes extended his dream argument (in the "painter's analogy") and developed the deceiving-God and evil-deceiver hypotheses.

The skeptical arguments of the First Meditation are sometimes studied in isolation from the remainder of the work, by those interested in skepticism for itself. We are interested in these arguments as steps toward the larger aims of the *Meditations*. In evaluating them, we will take their overall purpose into account. Descartes uses them to guide the meditator's search for certain knowledge and as part of his analytic method (explained in Ch. 2).

The title directs the meditator toward what can be "called into doubt." In this context, to "call" something into doubt means to give reasons for being uncertain about it. It does not require proving it false or believing in the opposite. We will therefore consider why, at the end of this Meditation, Descartes chooses to treat the merely dubious as if it were false.

As discussed in Chapter 2, Descartes thought that some of the meditator's beliefs were in error and needed changing (just as he had previously revised his own beliefs). The doubt begins a process that promises to replace falsehood with truth. According to the Synopsis, its purpose is threefold: (1) to "free us from all preconceived opinions"; (2) to provide "a very easy way to withdraw the mind from the senses"; and (3) eventually to make it "impossible for us to have any further doubts about what we subsequently discover to be true" (7:12; also 7:171–72). In other words, the doubt is undertaken to get rid of old, bad opinions and to withdraw the mind from the senses so as ultimately to achieve indubitable, or absolutely certain, truths.

So far so good, but we need to be more specific. Does Descartes want the meditator to revise all her previous beliefs, or only some of them, in philosophy and metaphysics? Does the Meditation explain why the mind should withdraw from the senses? Does it offer any reason to believe that doubting will lead to indubitable truth, or to any truth at all? Finally, does it call into doubt everything that can or should be doubted? Let us proceed with these questions in mind.

PROJECT (7:17–18)

The opening paragraph offers a specific reason for calling into question all previous beliefs. Descartes asks the meditator to believe that in childhood she (as he, and everyone else) accepted many falsehoods. These childhood beliefs form the substructure for adult thought. Because many of those beliefs are false, everything that has been built upon them is rendered dubious. Consequently, the whole body of one's beliefs should be put into question. The meditator should accept the need,

> once in the course of my life, to demolish everything completely and start again from the initial foundations if I wanted ever to establish anything firm and lasting in the sciences.
>
> (7:17)

This sentence announces that the aim of the current project is to establish something "firm and lasting" in the sciences. "Sciences" here means philosophical disciplines, including metaphysics, natural philosophy, and its branches: mechanics, medicine, and morals (recall Descartes' tree of knowledge from Ch. 1). As Descartes explains in the *Search for Truth*, the need for new foundations does not extend to languages, history, or geography, subjects that rest on "experience alone" (10:502). Although the passage does not specify how the demolition is to take place, we soon learn that it will occur through considering reasons for doubt, that is, by introducing skeptical arguments that lead, through a series of steps, to radical doubt.

From the fact that we accept many false beliefs as children, it does not follow that, as adults, we are mistaken about the established sciences as learned in school. And yet Descartes suggests that there is instability in the sciences and that he has a procedure for rectifying it. Such instability might have seemed plausible to some readers, as his age was a time of intellectual turmoil, in which established doctrines, such as that the Earth is at the center of the universe, were prominently under challenge. If the meditator accepts that the sciences need revision, she might hope to avoid the endless task of going through the body of recognized

sciences one by one in order to sort out the true and false propositions (see 10:497–98) – assuming that she already is prepared to discern what is true in the various sciences. Recalling that the *Meditations* is a work of metaphysics, the promise to establish something firm in the sciences presumably presupposes that metaphysics can offer a smaller set of principles for correcting natural philosophy and the other sciences.

Suppose that we accept (provisionally) that all the sciences are infected with falsehood and that metaphysics is the key to reform, because it serves as the basis for the other sciences. Is it obvious that we should then try to demolish all our opinions? Why not instead partition off our metaphysical beliefs, hold them as uncertain, and re-examine them as opportunity arises? Descartes does not adopt this strategy, even with the target now narrowed. He believed it to be crucial for the meditator to challenge all previous beliefs. In the Seventh Replies, he compared the process to removing bad apples from a full basket by dumping it over and surveying its contents (7:481). The analogy suggests that bad beliefs might be hidden by, or might hide, good ones, just as good and bad apples alike can be buried deep in a basket.

When he composed the *Meditations*, Descartes was already convinced that the true metaphysics is hidden from the human mind by childhood prejudices that typically arise from immersion in the senses. He also believed, and has the meditator affirm (7:22), that the senses serve as the basis for many useful and true beliefs – such as where the food is in the kitchen, or that a moving vehicle is about to run us down. His concern about the senses was not that they are always wrong (otherwise history and geography could not be reasonably trustworthy), but that they are not the right source for metaphysical knowledge. Descartes was convinced that the truths of metaphysics can be gained only through what philosophers later called *a priori* reason – and what he called the pure use of the intellect, independent of the senses. To appreciate the purely intellectual truths of metaphysics, we must turn away from the senses entirely and abandon the faulty, sense-based metaphysics that we erect from childhood prejudices. The general doubt is needed to suspend old beliefs that might hinder this process. If the doubt has done its job, any new truths

will be established on their own merit, without appeal to tradition or presupposition.

Returning to the basket analogy, the doubting exercise will not end with our simply surveying our previous beliefs to find the good ones and return them to the basket. Rather, Descartes thinks that in removing some bad apples, we will uncover some new types of apple, not seen before. As he explains to Hobbes in the Third Replies, the doubt is needed "to prepare my readers' minds to consider things related to the intellect and to distinguish such things from corporeal things" (7:171–72). Once this is achieved, Descartes believes he can establish a new metaphysics, as the foundation for the other sciences.

In the First Meditation, Descartes is not in a position to convince unsuspecting readers of these points. And yet he wants them to follow him in a process that will yield new metaphysical cognitions, if they withdraw the mind from the senses. Since he can't produce evidence of the need for such withdrawal prior to their having the new cognitions, he in effect asks his readers to go along, without offering convincing reasons for doing so. He is asking the meditator to get in the "game" of meditating with him. His promised prize: lasting knowledge in the sciences.

STANDARD FOR DOUBTING (7:18)

Having accepted the game, the meditator declares: "reason now convinces me that I should hold back assent from opinions that are not completely certain and indubitable just as carefully as I do from those that are patently false." The least uncertainty is enough for doubt.

Is this a reasonable procedure? That depends. While on a trip to the store, I cannot be absolutely certain that there are no elephants in my backyard at home. (A circus truck may have stopped nearby, and a pachyderm loosed its bonds – just maybe.) But, if told that a friend needs an elephant, it doesn't seem reasonable to say that I'm unsure (and so cannot assert) that I don't have any in my backyard. In ordinary life, we do not reject what is merely remotely dubious.

The strategy of withholding assent from the slightly dubious makes better sense as part of Descartes' project for seeking firm

foundations. If there are absolute certainties to be discovered, it is reasonable to look for them, on the assumption that such beliefs trump any weaker beliefs that conflict with them. They are the firmest kind of knowledge. If it can be done, it is reasonable to search for such certainties by challenging all of one's beliefs to see whether any remain immune from doubt. As Descartes subsequently explains, no harm can come, for the meditator is removed from action (7:22).

SENSORY FOUNDATIONS (7:18)

In seeking to undermine previous beliefs, Descartes does not direct the meditator to inspect all her beliefs one by one, as in the apple-basket analogy. Rather, once "the foundations" are undermined, everything else falls; therefore "I will attack straightaway the very principles upon which rested all that I formerly believed." These foundations are the senses: "Whatever I have thus far accepted as most true I have acquired from the senses or through the senses" (7:18). Such foundations include both previous sensory experience and opinions of others that come through the senses (by being heard or read).

It was a standard tenet of Aristotelian philosophy (also shared by the new empiricists) that "there is nothing in the intellect that was not first in the senses." In this epistemic scheme, the intellect requires sensory materials for its operation, even to think about God or other immaterial beings. Remember the Aristotelian position that there is "no thought without an image." This restriction extended even to thought of "common natures," such as the nature shared by all horses, or by all members of any natural kind; although the intellect abstracts what is "common" to all horses, it must use an image in thinking about this nature. Sensory images (or phantasms) are the basis of every thought. The project of withdrawing the mind from the senses is un-Aristotelian from the start. (A Platonist would welcome Descartes' radical withdrawal; we consider his relation to Platonism in Ch. 7.)

A focus on the senses is normal in early life (7:75, 157), but unless countered, Descartes believed, it causes the true metaphysics to remain obscured.

SENSORY FALLIBILITY (7:18–19); DREAM ARGUMENT (7:19)

The first challenge to the senses arises from their occasional deceptiveness. The meditator reasons: "but I have occasionally found that the senses deceive, and it is prudent never to trust completely those who have deceived us even once" (7:18). An example, from the Sixth Meditation (7:76), is a square tower appearing to be round when seen in the distance. But is it reasonable to distrust those who mislead us only once, no matter how trustworthy they otherwise are? The present project sets a high standard: absolute certainty. Even the smallest chance of deception discredits the witness. And yet, perhaps we know friends who misrepresent our culinary skill (when sampling our most recent effort) but would not deceive us in matters of life or death or concerning our livelihood. Even if we demand certainty, circumstances may indicate when our informant is to be trusted.

Similarly with the senses. Even if the senses deceive us about things small or far away, they seem trustworthy near at hand. Can we really doubt the things we see close up and in good lighting? Can we doubt the vivid sensory experience that we are seated here by the fire, reading this book? Someone who doubts the senses on such occasions seems as insane as those who think "that they have a head of earthenware, or that they are made entirely of gourds, or of glass" (7:19). Descartes does not propose that the meditator should consider, as a ground for doubt, the possibility that she is mad. In equating doubt about things seen up close in good light with madness, he offers a reason to dismiss such doubts.

With the argument from sensory fallibility rebutted, trust in the senses is now undermined by a more general argument that stays in effect until the Sixth Meditation. The meditator recalls that she sometimes has vivid experiences of touching objects right in front of her, even though they are not present. The vividness proposed as a mark of sensory reliability can occur in dreams. She quickly concludes "that waking and sleeping can never be distinguished by any sure signs" (7:19). (If you doubt this argument, propose a sure sign of your own and ask whether you could ever merely dream that it occurred.)

In presenting the dream argument, Descartes assumes that we understand what he is saying when he mentions dreaming and being awake. It may therefore seem as if he must presuppose that some experiences *really are* veridical waking experiences and some dreams. If his argument required being able to tell them apart, he would already have grounds for overturning it. His point is that, at least sometimes, the experiences involved in dreams are not distinguishable from waking experience. This point only requires that the reader understand (however she does) what is meant in saying that the experiences she calls dreams are sometimes indistinguishable from those she calls waking. Conversely, Descartes need not *prove* that there are no waking experiences; he is not initially trying to convince the reader that she is always dreaming. He simply seeks to instill doubt about whether she possesses a sure mark of sensory validity on any given occasion.

If accepted, the argument establishes that we might be mistaken on any given occasion about the presence of a whole scene or episode. But if it applies to *any* given occasion, it can now be generalized. If we cannot tell which are the waking experiences, none of our experiences are epistemically better off than dreams. For all we know, our experiences never reveal a present reality. As the meditator now muses, perhaps she not only is not now extending her hand or moving her head (she merely dreams it), but it may even be that "we do not have such hands or whole body" at all (7:19). Maybe she is dreaming all the time. The meditator now examines the radical proposal of a general discrepancy between the contents of sensory experience and the structure of the world.

PAINTER'S ANALOGY (7:19–20)

The meditator immediately considers a counterargument to this radical proposal. She asks how the content of dreams could arise. Even if we are uncertain whether any particular experience presents existing objects, "it must surely be admitted that the things that are seen during sleep are, so to speak, like painted images that can only be fashioned in the likeness of things that are real, and hence that at least these general kinds of things – eyes, head,

hands, and the whole body – exist as things that are not imaginary but real" (7:19–20). Just as painters use models, our dreams must be based on prior acquaintance with real objects. Even if dreams are jumbled up and out of sync with current reality, their content must derive from actual instances (models) of real things.

Painters typically did use models for imaginary scenes and nonexistent monsters. The monstrous forms in Hieronymus Bosch's *Garden of Earthly Delights* (*c.* 1505) are composed from various animal parts – for example, fish-headed or rodent-headed demons with human-like bodies. So perhaps dreams need to draw on previous experiences of heads and hands. At this stage, the dream argument would undermine knowledge of the coherent structure of the world as a whole and of the individual scenes that we experience, while leaving in place the supposition that there must exist models for the parts of the things that we experience.

Descartes now suggests an even more radical thought. Perhaps in imaginary scenes painters do not always merely "mix together the members of different animals" or other things but succeed in producing images that are "completely fictitious and unreal" (7:20). We know of such forms from twentieth-century Abstract Expressionist paintings by artists such as Jackson Pollock and Clyfford Still. Such forms should not look like animals, buildings, or any existing object.

If painters can produce wholly fictitious forms perhaps our dreams can too, and dream images need not derive from a real world. Can a wholly fictitious image tell us anything? In a painting, at least the colors must be real; the pigments used in the painting are real, hence pigments exist. Perhaps the more basic features of our experienced images reveal fundamental aspects of reality. These would be (as it were) "the real colors from which we form all the images of things, whether real or unreal, that occur in our thought" (7:20). (They are not material pigments, since Descartes is only using an analogy with painting; dream images are not composed of paint.)

The meditator now has some very Cartesian thoughts about these "real colors." By musing on the fundamental features of images, she arrives at a list of what Descartes in fact believed to be the fundamental features of material reality: "corporeal nature

in general, and its extension; the shape of extended things; the quantity, or size and the number of these things; the place in which they may exist, the time through which they may endure, and the like" (7:20). Images are intrinsically spatial and include bodies (corporeal things, impenetrable to touch and to one another). Extension, shapes, sizes, and relative locations (in depth – we sense, imagine, and dream in 3D) are basic aspects of imagined scenes, no matter how fantastic. Time reflects the temporal dimension of experience. The meditator concludes that spatial extension and temporal duration are the elements of any sensory-imaginal representation.

According to one possibility, these general features are just what an empiricist would be left with if forced by the dream argument to abandon knowledge of specific objects and retreat to the most general features of experience. Even an Aristotelian could follow the retreat this far (as long as the images from which to abstract these general features were granted). All the same, there is a notably Cartesian aspect to these remaining features. For Descartes does not include colors among the "real colors" of images. Even though visual images and visual dreams always include color with space and time (even black and white count as colors), Descartes resolves images into spatial and temporal properties. This foreshadows his later position, adumbrated in the Third Meditation and supported in the Fifth and Sixth, that, contra the Aristotelians, color is not a basic property of bodies. Here, he offers this result as the outcome of reflections on images. He has not argued for it; if the meditator now accepts it, she is on her way to becoming a Cartesian. If not, she can proceed to the next ground for doubt.

In denying knowledge of specific object forms, the meditator casts into doubt the findings of all the sciences concerning particular kinds of existing thing. Descartes lists physics, astronomy, and medicine. What is left as immune from doubt thus far? Only "arithmetic, geometry, and other disciplines of this kind, which treat only of the simplest and most general things, and care little whether they exist in nature or not" (7:20). Geometry describes the properties of shapes, whether such shapes actually exist or not. It describes a domain of shapes that could exist, without telling

us whether any specific shapes actually do. At this point, our remaining knowledge concerns only the most general forms that things could take. Still, the existence of a world having such forms has not been denied. At its most extreme, the extended dream argument undermines knowledge of any particular type of object, but not the existence of a material world itself (of whatever unknown structure). (At 7:28 and 7:77, comparison with dreams yields doubt about the material world's existence, but these passages occur after such doubt has been introduced on other grounds.)

The passage provides two examples of these "simplest and most general things" that remain undoubted: the addition of 2 and 3 to make 5 and the fact that a square has four sides. These things are true "whether I am awake or asleep"; indeed, "it seems impossible that such transparent truths should incur any suspicion of falsity" (7:20). At this point, the meditator may think that she has arrived at something "firm and lasting" in the sciences, the truths of mathematics, which seem evident ("transparent") – although, importantly, they are not described using Descartes' later standard for truth, that is, in this Meditation they are not described as "clear and distinct." Still, could anything be more certain? Descartes now endeavors to call even these truths into question.

DECEIVING GOD (7:21); MATHEMATICS DUBITABLE (7:21)

The meditator recalls a "long-standing opinion" that provides grounds for calling simple mathematical truths into doubt – the opinion "that there is a God who can do anything and by whom I, such as I am, have been created." An all-powerful God by itself provides no reason for doubt, but Descartes has the meditator assume that the omnipotent God is bent on deceiving her. Faced with this hypothesis, it may seem that no human belief can be placed beyond doubt.

DECEIVING-GOD HYPOTHESIS

The deceiving-God hypothesis plays an important role in the later *Meditations*. It is a powerful ground for doubt. Therefore, we want

to pay careful attention to how it is framed and what it casts into doubt. To that end, we first examine two distinct versions of the hypothesis, yielding somewhat different grounds for doubt, before asking which Descartes used.

An all-powerful deceiver might make us go wrong on either of two scenarios. First, if God were out to deceive us on particular occasions, then surely he could succeed at any time and, perhaps, about anything. Call this the *intervention hypothesis*:

> IH: God intervenes to give us false thoughts.

That is, God affects our minds at any given moment to give us the thought that something is true when it is false (or vice versa). If his specific interventions extended to all times, then we would be radically and permanently deceived.

Second, if God made us, perhaps he made us with a mental defect that produces false thoughts. Call this the *defective design hypothesis*:

> DDH: God made us in such a way that we produce false thoughts.

On this hypothesis, in creating and equipping our minds, a deceiving God makes us so that we often, or always, generate false thoughts, no matter how careful we are.

Either hypothesis can be used against both sense perception and intellect or reason. On IH, God causes us to have all the sensory experiences we now have without there being any material world at all. George Berkeley, the eighteenth-century Irish philosopher, affirmed it to be so (while denying he was a skeptic). IH is also similar to the recent "brain in a vat" hypothesis, in which individuals consider whether they are brains suspended in a vat of nutrients by mad scientists, with cables attached to the sensory and motor nerves and plugged into a computer that gives each brain sensory stimulation consistent with a complex world. (The brain-in-the-vat hypothesis importantly differs from the deceiving-God hypothesis, as a deceiving God would be understood to

intervene instantaneously, at any degree of complexity, without material instrumentality.)

Alternatively, IH could be used to call reason into question, by supposing that God intervenes sometimes, or always, when we add sums or count the sides of squares, and makes us go wrong. This would be similar to the mad scientists using implanted electrodes to give a jolt to the brain that makes it go wrong when reasoning.

DDH also can call the senses, reason, or both, into question. God might have designed our senses so that they produce a completely distorted view of the world. Although hard to imagine, they might produce experience of a spatio-temporal world when actually our world has no such properties. DDH calls reason into question on the supposition that God made us so that we sometimes, or always, go wrong when reasoning. (These cases might be compared with the hypothesis that each of us is an experiment in artificial intelligence, made with either defective sensors or defective logic routines, or both.)

DESCARTES' USE OF THE HYPOTHESIS

Given these possibilities, how did Descartes use his deceiving-God hypothesis? Let us consider two passages that follow immediately upon remembrance of the opinion of an omnipotent God. In the first, the corporeal or material world is called into question:

> How do I know that he [the omnipotent God] has not brought it about that there is no earth at all, no sky, no extended thing, no shape, no size, no place, and yet all these things would appear to me to exist just as they do now?
>
> (7:21)

In this passage, IH is used to question the entire sensory world. God ensures that we experience the very appearances that we do have, while all the time there is no spatially extended universe at all. Here, for the first time, the very existence of the material world as a whole is explicitly called into question.

What about the "transparent truths" of mathematics, which were to be the target of the deceiving-God hypothesis? At the

very least, they no longer serve as knowledge of the "real colors" of the world. On the "real colors" view, arithmetic and geometry describe the possible features of a universe that is unknown in its particulars. But if such a universe does not exist (as IH applied to the senses allows), then arithmetic and geometry do not apply to it. However, the fact that there is no material world to which mathematics applies does not entail its falsity. Descartes has said that geometry and arithmetic can be true whether their objects exist or not (7:20). Hence, in allowing that the material world does not exist, IH does not explicitly impugn the transparent truths of mathematics but merely their applicability to that world.

MATHEMATICS DUBITABLE

This brings us to the second passage, which immediately follows the first:

> What is more, since I sometimes believe that others go astray in cases where they think they have the most perfect knowledge, how do I know that God has not brought it about that I similarly go wrong every time I add two and three, or count the sides of a square, or something easier if such can be imagined?
>
> (7:21*)

Here the transparent truths of mathematics are called directly into question through the deceiving-God hypothesis. But in what form? Presumably as DDH, since Descartes has just proposed that God created me "such as I am" (7:21). Still, our origin is not mentioned here; rather, the meditator recalls that others go wrong even when they think they have perfect knowledge (a scenario mentioned in the *Discourse* [6:32] and described in the first person in Med. 5 [7:70]).

As the passage continues, DDH becomes explicit. Descartes has the meditator reason that "perhaps God has not willed me to be deceived in this way, since he is said to be supremely good." This suggestion is put aside: "if it were inconsistent with his goodness to have created me such that I am deceived all the time, it would

seem equally foreign to his goodness to allow me to be deceived even occasionally; yet this last assertion cannot be made" (7:21). The consistency of God's goodness with the possibility of deception is taken up again in Meditations 3–5. For the present, note that here Descartes explicitly links the deceiving-God hypothesis to our origin in saying that God might have created us so as to be deceived "all the time." DDH is expressed as our being created with a defect so that we go wrong in simple addition or counting, and perhaps in other simple acts of reasoning. Although not an explicit indictment of all reasoning whatsoever, it is a direct challenge to the transparent truths of mathematics.

I have framed the second argument as a challenge to "reasoning," even though Descartes did not use the term here. Moreover, in this Meditation the meditator focuses on the principle that knowledge comes "from" or "through" the senses. So is Descartes here challenging reason or the intellect at all?

There is a sense in which the truths of mathematics may come *through* the senses. Pupils learn addition in school. They may acquire simple arithmetical sums, or the ability to count to ten, as ingrained habits. This would not require that they grasp number relations or other mathematical truths in accordance with the best use of reason, by having "clear and distinct" ideas of them. Indeed, as Descartes later explains, if the meditator did have clear and distinct ideas of a mathematical proposition, or of counting the sides of the square, she would not be able to doubt those propositions at that time (7:36).

While it may seem precarious to interpret the phrase "through the senses" to include opinions received from others, Descartes crucially appeals to such opinions in these very passages. In introducing the deceiving-God hypothesis, he has the meditator recall "the long-standing opinion that there is a God who can do anything" (7:21). This language is chosen carefully (see 5:146). If the meditator were thinking of God directly, using her own (allegedly innate) idea of God (first uncovered in Med. 3), she would not be able to consider God as a deceiver. As Descartes explains in the Second Replies, at present all the meditator's ideas are "very confused and mixed up with ideas of sensible things" (7:130–31). As he explains to Bourdin, the meditator probably

hasn't yet had any clear and distinct ideas, and if she did have such an idea of God, she would not be able to attribute deception to him or to question whether he exists (7:476–77). Hence, it is important that the meditator is working merely with received opinions about God and possibly also about mathematics.

If the meditator here challenges our ability to reason correctly about even simple propositions in mathematics, she cannot be thinking of those propositions with clarity and distinctness (the best use of intellect or reason) in doing so. And in using the concept of a God who can do anything to challenge everyday acts of mathematical reasoning, she is appealing to an idea of God absorbed from tradition.

OTHER ORIGINS BESIDES DIVINE CREATION

In connection with the deceiving-God hypothesis, Descartes has the meditator consider another possible origin for human beings and their cognitive faculties. She considers the position of those "who would prefer to deny the existence of a God so powerful than believe that everything else is uncertain" (7:21). What other origin might human beings have besides divine creation? Descartes lists two alternatives. The first is "fate or chance"; humans would arise by chance, presumably from material origins. The second is "a continuous sequence of things"; humans would be the product of a long chain of natural events (perhaps an infinite sequence of parents and children). On either hypothesis, the meditator reasons, we would be the product of a "less powerful" original cause than an omnipotent God. But since "to be deceived and to err seem to be some kind of imperfection," the less powerful our cause the more likely that we are so imperfect as "to be deceived all the time" (7:21). Because less perfect than an omnipotent creator, natural causes or chance events would be more likely to produce a permanently defective cognitive structure.

The ultimate conclusion, on either the deceiving-God or defective-origins hypothesis, is that we might always be deceived. Consequently, the meditator finds herself "forced to admit that of the things I once deemed true, there is none that may not be legitimately doubted" (7:21). Since her aim is certainty, she

resolves to withhold assent from her former beliefs as if they were all falsehoods (7:22).

USE DOUBT TO GAIN KNOWLEDGE (7:22)

In the give and take of the First Meditation, three arguments have been allowed to stand: the dream argument, which challenges sensory experience of scenes and of a coherent world, and the deceiving-God and defective-origins hypotheses. Of the latter two, the first challenges the existence of the material world, and both undermine the truths of mathematics and perhaps ultimately all our thoughts and conclusions – or at least all of the meditator's former beliefs.

The meditator does not regard these reasons for doubt as arbitrary or weak but describes them as "powerful and well thought-out" (7:21–22). Descartes' aim was not to introduce doubt simply for the sake of doubting. He would not be satisfied if the meditator had simply *agreed* at the outset to doubt all her beliefs; he wants her to have reasons for doubting. Why so?

Reasons for doubting are needed to counteract the strength of the meditator's former opinions. Descartes concedes that many of the meditator's (and his) former opinions are credible, that they are "highly probable" so that it would be "more consistent with reason to believe than to deny them" (7:22). To give examples, prior to meditating, the meditator surely believed that Paris was in France, Rome in Italy, that vegetables could be found at the market, and many other truths. Yet now Descartes wants the meditator actually to hold such beliefs at bay. To achieve and maintain doubt, the force of reasons is needed.

Descartes' proffered justification for the wholesale rejection of one's former beliefs is telling. Such beliefs should be rejected "until the weight of preconceived opinion is counterbalanced" so that "no twisted habit can any longer bend my judgment away from the correct perception of things" (7:22). In fact, the meditator has not been given adequate reasons to believe that her preconceived opinions are epistemically pernicious, merely that they are dubitable. But in inviting her to the game, Descartes initially suggested that she harbors systematic errors. As the philosophical

author of the work, he thought that metaphysical beliefs in his time were incorrectly based in sense perception and that the "preconceived opinions" of childhood "render other concepts that we acquire later obscure and confused" (7:518). Acceptable sensory ideas had gotten mixed up with mistaken beliefs about the fundamental properties of things. Rather than trying to sort this out piecewise, Descartes would like the meditator to reject the whole package. What he hasn't yet revealed (except in the Preface and Synopsis) is that he thinks he can help her find a new (nonsensory) source of metaphysical cognition. In the quoted sentence, he is again asking her to go along with his procedure, on the promise that it will lead to correct judgments, which are established on their own merit.

These considerations offer reasons for doubting the senses. Why doubt mathematics? Descartes has promised the meditator a chance to find new foundations for knowledge that are absolutely beyond doubt. If her findings are immune to the doubts that challenge elementary mathematics (the paradigm of certainty at this time), she will have gained a firm foundation indeed. (We must wait to judge how firm this foundation is.)

Descartes' goal of achieving systematic and lasting knowledge in the sciences (especially metaphysics) distinguishes his use of skeptical arguments from classical skepticism as engaged by Sextus Empiricus (a "Pyrrhonian" skeptic) and other ancient philosophers, including "Academic" skeptics. Pyrrhonian skeptics investigate knowledge claims and find them wanting, allowing them to achieve an inner peace that comes from suspending judgment. Meanwhile, they are guided in action by appearances. Academic skeptics seek to determine whether perception yields certainty and, finding that it does not, guide their action by what seems probable. Descartes has the meditator suspend or negate previous judgments and challenge the value of appearances and the merely probable in order to discover new absolute certainties. He adopted and extended skeptical arguments for the aims detailed in the Synopsis: to discredit old, bad opinions, withdraw the mind from the senses, and achieve indubitable truths (see also 7:171–72, 476–77). For the purposes of ordinary life, he considered radical skeptical doubts to be laughable – so much so that

anyone's taking them to heart would raise questions about their sanity (7:16, 350–51). But for his philosophical project of reforming the sciences, radical skepticism is a useful tool.

POSIT MALICIOUS DEMON AS AID TO WILL (7:22–23)

Descartes expects the meditator to have trouble avoiding her usual beliefs and staying focused on the project at hand. Even if (as he later explains) suspending our judgment is "an act of will" and so is "in our power," we cannot simply "will" to forget our former beliefs (Letter to Clerselier, 9A:204). Our attention to the reasons for doubt may waiver and ingrained habits of belief prevail. Consequently, Descartes adopts a common practice from spiritual exercises and devises a program for training the will so as to keep old beliefs at bay.

Descartes indicates that the meditator should regard her previous beliefs not merely as dubitable (which is what his arguments were designed to show); she should now "turn the will in completely the opposite direction" and endeavor "to deceive myself and to pretend for a time that these former opinions are utterly false and imaginary" (7:22). The meditator should pretend that her merely dubitable opinions are actually false, so as to counterbalance the distorting influence of habit. There is no danger in regarding all her beliefs as false, since her aim is not "action" but "the acquisition of knowledge" (7:22; also 9A:204–5, 7:460–61). Her radical pretense is confined to meditating and is not applied in everyday life.

As a dramatic device for affecting the will, Descartes instructs the meditator to consider that not God but "some malicious demon of the utmost power and cunning" is out to deceive her (7:22). The apparently unmotivated shift from deceiving God to evil deceiver has frequently been noted. When asked about it, Descartes granted that the demon hypothesis might seem superfluous (given the deceiving-God hypothesis) but explained that he wanted to reinforce the doubt (Burman, 5:147). In fact, in the six Meditations Descartes brings up the malicious deceiver only once again, in the Second Meditation (7:24–26), treating it as

equivalent to the hypothesis of a "supremely powerful" deceiver. Most likely, he called his hypothetical deceiver a "malicious demon" in order to give full rein to this reason for doubt, without having the meditator concentrate extensively on the thought that God could be a deceiver, a proposition that he considered false (indeed, contradictory), which others considered impious, and which he intended to refute later (see 5:7–9). After defeating the deceiving-God hypothesis (Meds. 3–4), he did nothing further to remove the malicious-demon hypothesis, presumably considering it to derive from a confused idea of the true God considered as a deceiver (see 4:64). (Bourdin, however, assumed that Descartes intended the proof of God's goodness to entail his protection from the malicious demon for our clear and distinct perceptions [7:455–56].)

The evil-deceiver hypothesis completes the withdrawal from the world of the senses, by encouraging the meditator to treat "the sky, the air, the earth, colors, shapes, sounds, and all external things" as mere "delusions of dreams" (7:22). She will consider as false her beliefs that she has "hands, or eyes, or flesh, or blood, or senses" (7:23).

In listing what the evil-deceiver hypothesis calls into doubt, Descartes includes only external objects and one's own body. He does not repeat the challenge to mathematics. Does this mean that he did not really call mathematics into doubt? Hardly. More likely, he is focusing on those doubts that begin the Second Meditation – wherein the meditator is directed toward a new object of thought, not based in sensory images. Doubts about mathematics are taken up again in the Third Meditation.

ON WHAT IS AND IS NOT CALLED INTO DOUBT

The First Meditation was devoted to "demolishing" all the meditator's opinions. The exercise is deemed successful, for in the end the meditator concludes that she may be "deceived all the time" and that all of her former beliefs may properly be doubted (7:21).

From the start, readers have wondered whether Descartes really did subject all the meditator's beliefs (or his own) to the doubt (7:466–72), and if not, whether that impugns his subsequent arguments. There are two aspects to this worry. First, is the doubt

real? That is, did Descartes want the meditator actually to doubt the existence of the external world and the transparent truths of mathematics? Second, is the doubt complete? That is, did Descartes actually direct the meditator to doubt all of her beliefs and even her rational abilities?

THE REALITY OF THE DOUBT

As we have seen, Descartes, as author of the work, constructed the First Meditation to call into question the preconceived opinions of the meditator (7:12, 348, 465), not his own previously acquired metaphysical beliefs. As he later explained to Burman, the Meditation presents the point of view of one who is "just beginning to philosophize" (5:146). Its doubts are specially constructed for such a person. They serve a didactic function, as part of the meditative process.

Nonetheless, Descartes also wanted to use the doubt as a tool for arriving at unshakeable foundations for metaphysics, established on their own merit and without appeal to previous doctrine. If he were to presuppose those foundations without subjecting them to doubt, he could be accused of "begging the question." (To beg the question is to presuppose the truth of the very thing that is in question.) Hence, Descartes' method seems to require that he bring all of the meditator's opinions into doubt. But what sort of doubt? Is this doubt to be real, or merely "hypothetical" (4:64)? Is it real, or merely "hyperbolical" (7:89*) and "metaphysical" (7:36, 460)? Does Descartes ask the meditator merely to pretend to doubt?

In answering these questions, we should consider again the purpose of the doubt. We have seen that it is intended as an aid to inquiry, and not as something that should affect daily commerce. For this reason, the meditator has retreated from daily life. But we have also seen that, even in the First Meditation, Descartes concedes that many everyday beliefs are probable and only slightly dubitable. So why doubt them? I suggested above that Descartes asks the meditator to engage in a cognitive practice of doubting as if taking part in a game, with certainty and lasting knowledge as the prize.

Accordingly, the practice of doubting the reality of the external world, or simple mathematics, or God's goodness on the slightest grounds is "hyperbolical" or "metaphysical." And the arguments in the Meditation are intended to achieve at least this slight doubt. But the doubt is not merely pretend, because the project of doubting for the slightest reason is not pretend (7:350–51). On ordinary standards, such doubts are exaggerated. But the meditator is not engaged in ordinary cognition. She has accepted the project of meditating with Descartes, in order to discover unassailable foundations for metaphysics (9A:205). The only pretending comes in using the evil-deceiver hypothesis as a means for regarding merely dubious opinions as false. That pretense is undertaken for the methodological purpose of being able to ignore slightly dubious, ingrained beliefs while searching for metaphysical truths that have been established on their own merit.

More generally, the scope of the doubt is limited by the epistemic condition of the meditator. In discussing the First Meditation with objectors, Descartes made clear that aspects of the doubt could not actually be entertained by someone who had already achieved clear and distinct perceptions of God (7:460). To understand this more fully, we should investigate Descartes' notion of a beginner in philosophy.

A BEGINNER IN PHILOSOPHY

Early on, the meditator acknowledges the "large number of falsehoods that I had accepted as true in childhood" (7:17). In the *Principles*, Descartes explains the origin of the "preconceived opinions of childhood" (8A:32–37). They arise from the child's mind being immersed in the body and senses. The child accepts uncritically whatever the senses seem to show it – for example, that there is something in bodies "resembling" our sensations of heat, cold, light, color, and other sensory qualities (sensations of secondary qualities), and that the stars are very small (see also 7:82). As we grow to adults, we do not reconsider these prejudices and so come to believe that all substances can be perceived by the senses and hence are corporeal (8A:37). The procedure of doubting is intended to neutralize such prejudices.

Although Descartes describes the meditator as a beginner who must overcome the prejudices of childhood, he knew full well that such "prejudices" included many tenets of Aristotelian metaphysics and epistemology. As previously mentioned, Aristotelians held that all knowledge is based in the senses. The "resemblance thesis" of sensory qualities (discussed in Meds. 3 and 6) evokes the Aristotelian theory of real qualities. Furthermore, although Aristotelians believed that God is an immaterial substance (and so incorporeal), they also held that he can be known only by analogy with, and from the evidence of, bodily things – that is, things that can be sensed. The beginner who confuses mind with sensory or bodily things also fits the Aristotelian doctrine that all thought requires a phantasm, or sense-based image in the faculty of imagination. Although many Aristotelians held that the intellect itself does not require a bodily organ, they nonetheless taught that it can operate only in conjunction with the imagination, which does require an organ. Further, they conceived the intellect as a power of the form of a human being, a form that is naturally and essentially conjoined to matter.

The First Meditation, then, is aimed at the prejudices of childhood in themselves and as incorporated into Aristotelian philosophy. Descartes acknowledges this double audience in the *Search for Truth* (written near the time of the *Meditations*), in which his mouthpiece Eudoxus debates with Epistemon, a "schoolman" or Aristotelian philosopher, and Polyander, a man of good sense who is untutored in philosophy.

In weaning the mind from its sensory focus, the First Meditation attacks the reliability of sensory experience and even the existence of the material world. It also raises a radical doubt about mathematical judgments. Does it, and should it, aim to challenge all reasoning and to empty the mind of all beliefs, concepts, and ideas?

THINGS NOT DOUBTED

The Synopsis says that in the First Meditation "reasons are set out through which we can doubt all things, especially material things – that is, so long as we have no foundations for the sciences other than those we have had up to now" (7:12). This

last turn of phrase suggests that the effectiveness of the arguments for doubt is conditional on the state of knowledge of the meditator; the doubt can arise only for those (including beginners and Aristotelians) who have not already found the true foundations of science (see also 7:474).

At various places, Descartes suggests that some ideas, notions, and even metaphysical principles, once they are properly considered, are immune from doubt. When Bourdin (Seventh Objections) asks why the general doubt of the First Meditation was not applied to the "clear and distinct idea of God" (4:472), Descartes answers that at that point the meditator had not yet had a clear and distinct perception of God (7:476). The meditator is seeking a blanket doubt of all things and even entertains the thought that God does not exist (7:21). Descartes contends that her ability to do so depends on her epistemic condition: that she has not yet had a clear and distinct idea of God. If she had, she would be unable to doubt God's existence. The clear and distinct idea of God is immune from skepticism, for if skeptics "had perceived something clearly" they would have "ceased to doubt it and so ceased to be skeptics" (7:477). This suggests that only those who haven't yet had sufficiently clear perceptions will be drawn in by the First Meditation arguments.

Descartes suggests that Bourdin may be having trouble with the arguments because he is himself incapable of clear and distinct perception (7:477). This is a little quick. Even assuming that, up to now, the meditator has had few or no clear and distinct perceptions, that would not relieve Descartes from the obligation to extend his method of doubt beyond the preconceived opinions of his intended audience to his own beliefs. Moreover, even if Descartes was already convinced, prior to the *Meditations*, of metaphysical results that he considers indubitable, the meditator (and everyone else) is in a different situation. For her, the cognitive merit of the Cartesian metaphysics has not been established. She should want to be shown, in the course of the work, that both Descartes' principles and his method for proving them are immune from doubt.

Leaving aside his own metaphysical results, Descartes held more generally that the procedure of doubt could not – and

should not be expected to – call absolutely all thoughts into question. In the Letter to Clerselier, he acknowledges that the First Meditation doubt could never empty the mind totally of everything, including all concepts and ideas (9A:204); that would be to abandon thinking altogether. In effect, he contends that the basic structure of thought itself, and the principles of reasoning, cannot be negated through a process of doubt. Not only are they called upon in evaluating the reasons for doubt and establishing any new results, but they also form the indelible structure of the mind as a mind.

Although there is something right in this point, one still may ask whether the particular structures Descartes held to be basic to the mind really are basic, and whether they actually do afford knowledge of things as they are in themselves. Among such structures, he includes not only "common notions," such as "What is done at any time cannot be undone" (7:145), but innate ideas of what thought is, or what existence is (7:422). If he is right about these innate elements, the meditator should, upon further investigation, be able to recognize their indelible presence to mind. (As Descartes implies in responding to Bourdin, the proof of the pudding is in the eating [7:542].)

In addition to the common notions just mentioned, Descartes also (at least tacitly) invokes the notion of causation in the First Meditation. Instances occur in the deceiving-God and evil-deceiver argument, which posits a powerful being who might cause our sensory experiences even though there are no external objects. Furthermore, in the deceiving-God and defective-origins arguments, he considers alternative causal origins for human beings and their cognitive faculties. Such arguments do not require causal principles to be true (as do the Third Meditation [7:40] and Geometrical Arguments [7:164–66]); they merely use such principles to provide plausible (but not certain) grounds for doubt. It is enough if the meditator understands the arguments and finds them sufficient to cast doubt. Descartes is using a commonly accepted notion of causality to undermine other commonly held beliefs. The arguments do not presuppose the truth of his metaphysical principles of causation, but they do not question those principles either.

TRANSPARENT TRUTHS AND THE DECEIVING GOD

In the Second Replies, Descartes explicitly addresses the question of how, and whether, various simple notions and apparently evident truths can be brought into doubt. He argues that some perceptions are "so transparently clear, and at the same time so simple, that we cannot ever think of them without believing them to be true"; but, since "we cannot doubt them unless we think of them," "we can never doubt them" (7:145–46). If correct, this argument seems to imply that simple mathematical propositions such as 2 + 3 = 5 could never be doubted (see also 7:36). And yet Descartes claims to bring such propositions under doubt in the First Meditation. Does he believe that "transparent truths" (7:20), such as those of mathematics, can be doubted, or not?

He addresses this puzzle in the Second Replies by distinguishing two cognitive relations we may have toward evident truths. First, when we think directly of such truths, they seem so evident that we cannot doubt them. But, second, if we do not think of such truths directly but merely remember having thought of them, then the hypothesis of a deceiving God is sufficient to cast doubt on them (7:146; see also 7:246, 460, and 9A:205). This subtle distinction between merely remembering evident truths and considering them directly is not raised explicitly until the Third Meditation and is discussed at length only in the Fifth.

This example again raises the question of how much could, and should, be subjected to Cartesian doubt. The answer depends on larger questions concerning Descartes' project. The next two sections consider the implications for the role of the doubt of two conceptions of Descartes' project. The first sees the *Meditations* as aiming for a general vindication of reason. The doubt serves as a stringent test of reason's claim to achieve knowledge, and it must therefore be as radical as possible. According to the second conception, Descartes was not trying to vindicate reason but to reform metaphysics. A key element was to exhibit a new metaphysical epistemology that relies on the pure intellect independently of the senses. The doubt serves to uncover this hitherto unappreciated cognitive resource (as in the cognitive and metaphysical reading of Ch. 2).

THE VINDICATION OF REASON

Suppose that Descartes' project in the *Meditations* was to vindicate human reason (or pure intellect) generally. Accordingly, in the First Meditation (or the First and Third) he would bring forward the strongest grounds for doubt to see if they can be met. There are two versions that such vindication might take. The first, weak vindication, occurs if reason investigates all reasonable grounds for doubt and finds them internally inconsistent or otherwise logically flawed. Reason would be vindicated by ascertaining that there are no good grounds for doubting its validity. The second version, which we can call strong validation, undertakes to prove that reason is sufficient for establishing metaphysical truths about the way things really are. It must show not merely that there are no good challenges to reason but also that it can reveal deep truths about the structure of reality. Under both strategies, reason itself would need to evaluate skeptical challenges and other arguments, since there are no other means for doing so.

The strategy of strong validation may appear hopeless on the face of it. If reason's trustworthiness has been successfully challenged (e.g., by the deceiving-God hypothesis), how could it ever recover? Since it would stand alone in its own defense, the burden of proof would be insurmountable. But, more importantly, even if reason should survive a skeptical challenge, that would not be enough. To achieve strong validation, reason must *prove* its own reliability as a source of knowledge about the basic structure of reality. How could it, when that reliability is the matter in question? We have granted reason's ability to check for contradictions and assess the relation between premises and conclusions. (This supposition might be challenged, but let us grant it for now.) If all arguments for doubting its reliability are found wanting, its reliability would merely not have been disproved. The burden of proof remains on reason, not the skeptic.

Weak vindication makes a virtue of this situation. Once all known challenges to reason are found wanting, reason is vindicated by having survived the strongest available attack. Weak vindication seems on the face of it more likely to succeed than strong validation, but it has the disadvantage of simply leaving

reason on the field unchallenged, yet unsupported by positive argument.

We must await the later Meditations to examine more fully these two strategies (and their kin). For now, let us consider an alternative reading of Descartes' project.

DISCOVERY OF THE INTELLECT

A second way of conceiving Descartes' use of skepticism in the *Meditations* focuses on its methodological function in reforming the meditator's metaphysical epistemology. Accordingly, Descartes as author already knows that the pure intellect can achieve results because he has attained them himself (see 7:542). He believes that everyone has a pure intellect and that everyone will be convinced of his metaphysical principles if they use their intellects. But he also believes that sensory immersion has obscured the pure intellect. His problem is not to validate reason or the intellect (its results will be accepted once they are seen) but to bring his readers to the realization that purely intellectual cognition is possible.

From this perspective, we can see why in the Preface Descartes invites only those "who are willing and able to meditate seriously with me and to draw their minds away from the senses" to read his book (7:9). We can also understand why, in the Second Replies, he suggests that although the skeptical arguments of the First Meditation are "reheated" and "stale" leftovers from the ancients, readers should spend "several months, or at least weeks," doubting especially corporeal things (7:130–31). He concedes in the Seventh Replies that the radical doubt "applies only to those who have not yet perceived anything clearly and distinctly"; but he further maintains that "before making such a renunciation [of previous beliefs] hardly anyone perceives anything clearly" (7:476–77). Even if his readers have been using their intellects to some extent throughout their lives, they have not attained the kind of intellectual clarity that comes from fully turning away from the senses. And it is that sort of pure intellectual clarity (untainted by sensory images of any kind) that is needed for metaphysics.

On this reading, the first two Meditations are constructed to enable the meditator to discover the pure use of her intellect, in part by ignoring material things. She is to discover that thought without an image, thought that is not sense-based, is possible. That is something Descartes expected his readers either not to know (in the case of the beginner) or vigorously to deny (in the case of the Aristotelian).

Accordingly, Descartes would not be begging the question if he constructed his *Meditations* on the assumption that the pure intellect exists. He would only be begging the question if he expected readers to accept what he said about the pure intellect without experiencing its deliverances for themselves. His first aim would be to bring readers to intellectual experiences that they haven't had, or haven't reflected on, heretofore. If he succeeds, the reader will come away convinced by the arguments and – if he is right about the intellect's power – in possession of the one true metaphysics. If the reader doesn't attain these intellectual experiences, then either they have not been attentive enough or Descartes' theory of pure intellect is wrong and his metaphysics is not grounded as he thinks. (An attentive but unconvinced reader will eventually lose patience with a defense that appeals to the reader's inattention.)

This reading accepts the proposal above that the challenge to mathematics was meant to set a very high bar for turning back the doubt. Descartes seeks to show that the primary notions of metaphysics "are by their nature no less knowable than, or even more knowable than, the primary notions that the geometers consider" (7:157). If the intellectual perceptions supporting metaphysics equal or excel those of mathematics, that would be strong support indeed in an age when Euclid's geometry was the paradigm of good reasoning.

These differing conceptions of Descartes' aims raise interesting and difficult questions, which receive elaboration in Ch. 5. For now, in going forward we should keep in mind the "vindication" and "discovery" strategies. In doing so, we should attempt to discover both what arguments Descartes offered and what further arguments or presuppositions (if any) may be required actually to establish his metaphysical conclusions.

REFERENCES AND FURTHER READING

The First Meditation has received the most extensive analysis of any. Interpreters differ on many issues, including the relation of the doubt to everyday belief, the differences between Descartes' arguments and ancient skepticism, whether Descartes really has the meditator suppose that God is a deceiver, and the reality of the doubt.

Frankfurt devotes nearly half of *Demons, Dreamers, and Madmen* (Indianapolis: Bobbs-Merrill, 1970) to this one Meditation, as supporting an internally consistent vindication of reason (but not strong validation). B. Williams, ch. 2, portrays the method of doubt as abetting "pure rational enquiry," with the flavor of strong validation. Ronald Rubin, *Silencing the Demon's Advocate: The Strategy of Descartes' Meditations* (Stanford: Stanford University Press, 2008), examines the First Meditation thoroughly in connection with weak vindication. Flage and Bonnen, ch. 4, examine the Meditation in relation to Descartes' analytic method. Secada sees Descartes using skepticism as a tool for establishing his metaphysics.

Barry Stroud, *The Significance of Philosophical Skepticism* (Oxford: Clarendon Press, 1984), reads the First Meditation in isolation as challenging ordinary knowledge of the material world (similar to the present-day epistemological "problem of the external world"), placing would-be knowers behind a "veil of perception." Michael Williams, "Descartes and the Metaphysics of Doubt," in A. Rorty, 117–39, also criticizes Descartes in connection with the epistemology of sense-data. My reading puts Descartes' skeptical arguments in the service of his metaphysical epistemology, unconcerned with the problem of the external world as regards everyday belief. (Of course, readers may adapt Descartes' arguments to other purposes than his own.)

Broughton devotes half of her book to the First Meditation, including extensive discussion of Descartes and ancient skepticism. She imagines Descartes inviting the meditator to a skeptical game (pp. 49–51). She portrays his method of doubt as artificial and method-driven and not as arising from everyday epistemic practices.

Mersenne's book on skepticism, *La vérité des sciences: Contre les sceptiques ou Pyrrhoniens* (Paris: Toussainct du Bray, 1625; reprint, Stuttgart-Bad Cannstatt: Frommann, 1969), defends Aristotelian and other types of philosophy against skeptical attack, finds mathematics the most secure from skepticism, argues that the senses are not deceived under proper conditions, and maintains that a science of phenomena is possible, and perhaps even a science of essences.

On skepticism in Descartes' time, see Richard H. Popkin, *The History of Scepticism from Savonarola to Bayle*, rev. ed. (Oxford: Oxford University Press, 2003), who makes defeating the skeptic paramount for Descartes, and Lennon, *Plain Truth*, who has Descartes contemptuous of skepticism and seeking weak vindication. On ancient skepticism and its revival, see Richard Bett (ed.), *Cambridge Companion to Ancient Scepticism* (Cambridge: Cambridge University Press, 2010). On Descartes and ancient skepticism, see Gail Fine, "Subjectivity, Ancient and Modern: The Cyrenaics, Sextus, and Descartes," in Jon Miller and Brad Inwood (eds.), *Hellenistic and Early Modern Philosophy* (Cambridge: Cambridge University Press, 2003), 192–231. On the continuing history of skepticism, Walter Sinnott-Armstrong (ed.), *Pyrrhonian Skepticism* (Oxford: Oxford University Press, 2004).

On Aristotelian theories of cognition as a background to Descartes, see Hatfield "The Cognitive Faculties," in Ayers and Garber, *Cambridge History*, 953–1002, which notes that Albert the Great and others, in contrast to the Aristotelian philosophers cited by Descartes, regarded knowledge of nature as derived from sensibles but allowed intuitive intellectual knowledge of God and the soul without a phantasm (p. 961, n. 43). On the role of the faculties in early modern philosophy generally, see the preface and first two essays in Patricia Easton (ed.), *Logic and the Workings of the Mind: The Logic of Ideas and Faculty Psychology in Early Modern Philosophy* (Atascadero, Calif.: Ridgeview Publishing, 1997), and David Owen, *Hume's Reason* (Oxford: Oxford University Press, 1999).

4

DISCOVERING THE NATURE OF MIND

MEDITATION 2: THE NATURE OF THE HUMAN MIND, AND HOW IT IS BETTER KNOWN THAN BODY

The Second Meditation contains the famous *cogito* reasoning. This initial result, in which the meditator recognizes her own existence, occurs early on. The real work then begins. The main topic of the Meditation is not the meditator's existence but her nature.

Although the Meditation's title promises a discovery about the nature of the human mind, the Synopsis warns that full knowledge of the mind's essence, as an immaterial substance distinct from body, awaits the Sixth Meditation. Whatever is learned about the mind's nature in this Meditation falls short of proving its immateriality. Through contemplating how she knows her existence, the meditator comes to regard herself as a thing whose nature is to think and also to examine the nature of thought itself. Prior to launching these investigations, however, she reviews the larger project underway.

THE ARCHIMEDEAN POINT (7:23–24)

The opening paragraph finds the meditator mired in the doubts of "yesterday's meditation" (7:23). Despite the dizzying effects of this deep doubt, she resolves to "make an effort and once more attempt the same path that I began yesterday" (7:24). She recalls the strategy in play:

> Anything that admits of the slightest doubt I will set aside just as if I had found it to be wholly false; and I will proceed in this way until I recognize something certain, or, if nothing else, until I at least recognize for certain that there is no certainty.
>
> (7:24)

The meditator's immediate goal is to use doubt as a tool to achieve certainty, even if only to find "for certain" that certainty cannot be attained.

Following this momentary suspense about the expected outcome, the next sentence foreshadows great consequences:

> Archimedes asked only for one firm and immovable point in order to shift the entire earth; great things are also to be hoped for if I manage to find even the least thing that is certain and unshakeable.
>
> (7:24)

The ancient mathematician Archimedes observed that, with a sufficiently long lever and a fixed point off the Earth, he could move the entire globe. Similarly, Descartes promises, just one unshakeable truth would also produce great things – presumably, much certain knowledge.

It is not evident why a single certainty should lead beyond itself. Suppose that you know just one thing with certainty, say, that your sister is now at home (and you there with her), or that $2 + 3 = 5$ (to use neutral examples, already under doubt). Why should one such piece of knowledge lead to more knowledge? Three possibilities come to mind. First, a given piece of knowledge might provide a single first principle, which acts as an axiom or postulate for deriving other knowledge in the synthetic method

(discussed in Ch. 2). Through its own fecundity, this principle would yield a large body of knowledge. (Call this the "foundationalist answer.") Second, perhaps some knowledge comes with connections to other knowledge already "built in." For example, knowledge that 2 + 3 = 5 might arise only as part of a system, making it impossible to know one thing without implicitly knowing other, coordinate, things. Perhaps one can't really know that 2 + 3 = 5 without also knowing that 1 + 1 + 3 = 5. In that case, discovering any single truth would be the tip of the iceberg. Implicit connections within the first bit of knowledge would produce a whole system of knowledge. (Call this the "systematicity answer.")

Third, the meditator might hope that in attaining just one piece of certain knowledge, she will discover *how* to find certainty. That is, this first item reveals the proper *method* of knowing, yielding other certainties through using the method again. (Call this the "methodological answer"; it coheres with the cognitive reading from Ch. 2.) Let us keep these possibilities in mind as we examine Descartes' "Archimedean point" and its use to achieve "great things."

REVIEW OF DOUBT (7:24); *COGITO* REASONING (7:24–25)

Descartes has the meditator review the state of doubt. Consonant with the strategy of treating as false what is merely dubitable, she maintains that "my memory tells me lies," "that none of the things that it reports ever happened" (7:24). In doubting her memory, she is denying her previous beliefs about things in the world (now treated as mere memories) and not her memory that she is engaged in meditation, that she has accepted some arguments for doubting, and so on (see Burman, 5:148). The objects of the senses are also in doubt: "Body, shape, extension, movement, and place are chimeras" (7:24); "there is absolutely nothing in the world, no sky, no earth, no minds, no bodies" (7:25). At this point, she discounts the existence of minds as a kind of thing, although not, it soon turns out, the existence of her own thoughts.

In reviewing the doubt, the meditator asks whether, from the fact that she has thoughts, it follows that she exists. If she is the

"author" of her own thoughts (7:24), "am not I, at least, something?" But she is doubting the existence of bodies and minds. Does that mean that she herself does not exist? No. "If I convinced myself of something, then I certainly existed" (7:25). Even if a deceiver is constantly deceiving her, "in that case I too undoubtedly exist, if he is deceiving me." Indeed,

> let him deceive me as much as he can, he will never bring it about that I am nothing so long as I think that I am something. So that after considering everything enough and more, I must finally conclude that this proposition, *I am, I exist*, is necessarily true whenever it is put forward by me or conceived in my mind.
>
> (7:25)

This conclusion was expressed in the *Discourse* through the legendary proposition "I think, therefore I am" (6:32). This statement is called the *cogito* because in Latin it runs *cogito, ergo sum* – although this exact phrase does not appear in the Second Meditation. (It occurs in the Second Replies [7:140], paraphrasing this Meditation.)

Much energy has been spent interpreting the *cogito* and its significance. Differing positions have been taken on what precisely its conclusion is, how that conclusion is established, and what it means philosophically. Accordingly, our investigation is guided by three types of question: (1) What exactly is the conclusion? That is, precisely what is established? The bare existence of the meditator? That a mind exists? That an immaterial substance exists? (2) How is the conclusion as stated in the Meditation, "I am, I exist" (Latin *Ego sum, ego existo*), established? Through deductive argument (perhaps using suppressed premises), or in some other way? (3) What is the function of this conclusion in Descartes' philosophy? How does it yield other knowledge? In seeking answers, in addition to the Meditation we consider Descartes' restatements of the *cogito* reasoning elsewhere.

WHAT IS THE CONCLUSION?

The *initial conclusion* drawn in the *Meditations* is simply "I exist." In this conclusion, the "I" remains unanalyzed; the conclusion

appears to be limited to the meditator's existence. But this existence has been established by reflecting on the fact that she has doubted, or been deceived, or had various thoughts. Moreover, the meditator has just accepted that she has no body or senses. The "I" that exists is not known as body. So how is it known? Inasmuch as it doubts, is deceived, or asserts "I exist." Moving forward, we need to consider whether this context enters into the content of this first conclusion.

Having reached this initial conclusion, Descartes has the meditator explore "what this 'I' may be, that now necessarily exists" (7:25), a task that fills the remainder of the Meditation. The meditator quickly reaches an *extended conclusion*, that she exists as "a thinking thing" (7:27). This new conclusion characterizes the existing thing as of a certain type – as a thinking thing.

The initial and extended conclusions provoked immediate queries from the objectors and have been discussed ever since. However, they do not end the *cogito* reasoning. The investigation of the "I" continues throughout the Meditation, reaching further conclusions about its nature.

The initial conclusion "I exist" requires further scrutiny. As a metaphysician, Descartes held that essence is known prior to (or at least together with) existence. As he asserted in the First Replies, "according to the laws of true logic, we must never ask *whether something is* unless we first understand *what it is*" (7:107–8*). As he explained in the Fifth Replies, someone cannot know that he exists without also knowing what he is, that is, his essence or nature (7:359) – a clear departure from the usual Aristotelian doctrine that a thing's existence is perceived prior to grasping its essence. These considerations raise questions about whether Descartes believes that the initial "I exist" includes an implicit recognition of one's nature as a thinking thing; otherwise, he has had the meditator violate the true logic.

The bare conclusion "I exist" has itself been challenged, most famously by the eighteenth-century German thinker Georg Lichtenberg. He is credited with suggesting that from the fact that the meditator has thoughts (is doubting, has been deceived, or any thoughts you like), she is not entitled to conclude "I exist" but only "there is thinking going on" or "there are thoughts."

("Thought" is understood broadly, by both Lichtenberg and Descartes, to include all conscious mental states.) To posit an "I" is to move without justification beyond the mere presence of thoughts. The meditator should affirm the thoughts, Lichtenberg held, without affirming an "I" that has them.

In assessing this objection, let us first consider possible interpretations of the "I" in "I exist" and ask how they relate to Lichtenberg's complaint. One possibility is that the "I" refers to a living, breathing person, perhaps even to René Descartes, born in France in 1596, educated at La Flèche, and living in the Netherlands. But Descartes is not claiming to show that an embodied person, the subject of various geohistorical facts, exists. The meditator has accepted that there is no material world, or indeed anything beyond the bare "I" whose existence is affirmed. Most likely, Lichtenberg was not this far off target and this interpretation can be put aside.

Lichtenberg's objection is better suited to what we have called the extended conclusion, that the meditator is "a thinking thing" (7:27). His concern would be whether a mere awareness of thoughts can establish that a "thing" exists, conceived as a persisting subject, or indeed a substance, having those thoughts. (A "persisting subject" means a thing that exists over time and has now this thought, now another, etc.) Or it may even be that Lichtenberg (as other readers, despite Descartes' warnings) believed that Descartes wanted to prove, here in the Second Meditation, the existence of the "I" as an immaterial substance, distinct from body. In that case, Lichtenberg's objection would be misplaced.

Even once the "I" has been identified as a thinking thing, it is not yet clear how much Descartes intended to claim for it and therefore how far Lichtenberg's objection applies. The initial *cogito* passage concludes "that this proposition, *I am, I exist*, is necessarily true whenever it is put forward by me or conceived in my mind" (7:25). This makes it seem as if the "I" does not extend beyond present thoughts. On this "thin reading," the thinking thing is wholly constituted by those thoughts currently before the meditator. That is, the meditator's affirmation of her existence as a thinking thing extends only to the stream of thoughts present

to her during the *cogito* investigation, without including an underlying subject. Lichtenberg's comment allows affirmation of such thoughts but doesn't count them as an "I." The thin reading, as a reading of the "I," proposes that they should count.

The thin reading is attractive because it avoids Lichtenberg's objection that the extended conclusion goes beyond present thoughts. As an interpretation of the thinking thing, however, it is contradicted in the Third and Fifth Replies. In reply to Hobbes, Descartes glosses the thinking thing as a "thing or substance" (7:174), allows that "we cannot conceive of thought without a thinking thing" (7:175), and says further that "it is certain that a thought cannot exist without a thing that is thinking, and that in general no act or accident can exist without a substance to inhere in" (7:175–76). In other words, individual thoughts must be regarded as the acts of a persisting thing, which is capable of having one thought, then another, and so on. In reply to Gassendi, he restates his conclusion from the Second Meditation as "I am a thinking substance," again treating this as equivalent to "I am a thinking thing" (7:355). These statements admittedly appear in the Replies, where Descartes speaks with full knowledge of the results of the *Meditations*. Still, we must take seriously his gloss of "thing with properties" as "substance," which suggests that in affirming a thinking thing, he intends to posit a substance (see also 8A:24–25).

If the meditator has already concluded that the thinking thing is a substance, does she fully know what kind? All she now knows are her thoughts, and she concludes only that she is a thinking thing or substance. Does this mean she knows that she is not a body, or is immaterial? Descartes claims, several times (7:13, 131, 175), to reserve that conclusion for the Sixth Meditation. Therefore, a Second Meditation conclusion that the thinking thing is a substance whose nature is to think must leave open whether it is an immaterial substance (see 7:27). We need therefore to distinguish a thinking substance, viewed as an immaterial being, from the less determinate notion of a thinking thing whose further properties remain unknown – such as whether it is identical with bodily states, is immaterial, or even is a conglomerate of disjoint things.

Our reflections have found three interpretations of the "thinking thing" (7:27) in the Second Meditation:

(1) *Thin reading*: "thinking thing" refers only to the stream of thoughts.
(2) *Thinking thing, of otherwise unknown type*: no claim about its identity or non-identity with body.
(3) *Thinking substance, immaterial*: an immaterial substance distinct from body.

Interpretations (1) and (2) are permitted by the initial and extended conclusions reviewed thus far. Interpretation (2) is supported in the Third and Fifth Replies. Interpretation (3) is rejected in several places, although Descartes believed that the Second Meditation helped to prepare for the conclusion it expresses.

HOW IS THE CONCLUSION ESTABLISHED?

Consider first the initial conclusion, "I am, I exist." The meditator claims that it "is necessarily true whenever it is put forward by me or conceived in my mind" (7:25). And indeed the conclusion appears forceful. It seems compelling that, when thinking (whether doubting, or having any other thought), we are unable to deny our own existence. (If you don't believe this, try to convince yourself that you – as a thinker, and leaving aside your body – do not exist.) But where does the conclusion get its force? Does it follow from a logical argument, that is, by deductive inference from the premise "I think," perhaps together with other premises? Or is it known immediately, through the mere awareness of some thoughts? Or is it a presupposition of the act of doubting?

If it follows from a logical argument, we need at least one additional premise. But at this point in the *Meditations*, besides the awareness of thoughts themselves, the conclusion "I exist" is the only positive assertion. It is not apparent where other premises would come from. So let us first consider the possibility that the conclusion is known immediately, without argument.

Perhaps the conclusion is established, without argument, on the simple grounds that denying one's own existence is paradoxical.

Compare this situation with answering "absent" when the roll is called in a class. It is futile to give that answer, because it undermines itself. It is apparent to everyone else, and should be apparent to you, that you are present when you say "absent." Your answering the roll call allows everyone not so much to infer as to observe that you are present. Similarly, affirming that you do not exist gives you evidence that you do.

It is true that in saying you are absent, or attempting to doubt or deny that you exist, you produce evidence to the contrary. Does this show that you don't need an argument to appraise that evidence? Not by itself. Perhaps to know with certainty that you are present, your classmates need to rule out the possibility that someone played a recording of your saying "absent." They might point to aspects of the evidence at hand in attesting to your presence. Similarly, perhaps in assessing the force of the mental affirmation "I exist," further points are needed.

Another way of supporting the conclusion that you exist is to point out that it is a presupposition of the conclusions of the First Meditation. Perhaps it is simply obvious that you cannot engage in an activity, such as doubting, unless you exist. Or that if something happens to you, such as that you are deceived, you must exist. Again, a question arises of what is involved in moving from "I am doubting" or "I am deceived" to "I exist." Is the move simply self-evident?

The decision about whether an argument is needed turns partly on what counts as an inferential argument and what as non-inferential knowledge. For the moment, put aside the Cartesian doubt and consider an ordinary case, in which you are seated at your kitchen table having a glass of water. Do you need an inference to establish that you are seated at a table, or that you have a glass in front of you? Usually, it seems that such things are known without argument, just by looking. Of course, you need to know what a table is and what a glass is in order to see just by looking that those things are present. But an argument doesn't seem to be required. Moreover, if you needed premises and arguments to conclude that a table is there, would they also appeal to perceptual evidence? But what if a premise were "things wouldn't look that away unless I was at the table"? In the *Meditations*, the

counterpart to knowing just by looking would be that the *cogito* conclusion is supported simply through the contemplation of one's thoughts (represented in the phrase "I think"). On this view, one perceives his or her existence through the awareness of thoughts. Is nothing else needed?

To help uncover Descartes' position, let us consider passages that directly speak to whether an inference is needed, from the Replies, *Principles*, *Search*, and conversation with Burman. As it happens, these passages taken together offer apparently contradictory answers. Some seem to affirm that the *cogito* is a logical argument requiring an added premise beyond "I think," others to deny it. Although it is possible that Descartes changed his mind or contradicted himself, the fundamental position of the *cogito* in his philosophy requires that we carefully examine the relevant passages.

These passages agree on at least one thing: in order to use awareness of one's thoughts to know that one exists, one must know "what thought is" and "what existence is" (7:422; also 8A:8, 10:522–24). Descartes insists that he is permitted such concepts (even in the midst of radical doubt). As he explained in the Letter to Clerselier, "I have denied only preconceived opinions – not notions such as these, which are known without any affirmation or denial" (9A:206). Such concepts or notions are like elements of thought, without which no thought (not even grounds for doubt) could be framed. Accordingly, use of concepts such as thought and existence requires no justification, just as the concepts of table or glass might be presupposed in perceptual knowledge. (Both sorts of presupposition can be challenged; see Chs. 7 and 10.) But these concepts are not thus far expressed in premises as in a logical argument. Hence, we need to look further.

Consider the Second Replies, which apparently says that no inference is involved:

> When someone says "I am thinking, therefore I am, or I exist," he does not deduce existence from thought by means of a syllogism, but by a simple intuition of the mind recognizes it as something self-evident. This is clear from the fact that if he were deducing it by a syllogism,

> he would previously have had to know the major premise "Everything that thinks is, or exists"; yet in fact he learns this from experiencing in his own case that it is impossible that he should think without existing.
>
> (7:140)

A syllogistic inference from "I think" to "I exist" would require an additional premise, "Everything that thinks exists." But Descartes denies that, in his case, any such premise is needed and asserts that existence is established from awareness of thoughts through "a simple intuition of the mind," as something "self-evident" (Latin *per se notum*). We know from the *Rules* that a "simple intuition" is something that can be seen "all at once," or encompassed in a single act of thought (10:407; also 5:136–38).

Regarding this position, we might ask how an intuitive awareness of thoughts can establish the existence of an "I" or a "thinking thing." The thin reading would help. If the "I" or "thinking thing" is equated with the very thoughts themselves, then intuitive awareness of them, in a single act of thought, just is awareness of the thinking thing's existence. No inference is needed.

However, if Descartes does not hold the thin reading but takes the "I" to be a persisting thing or substance (as in position (2), above), there is trouble for the view that non-inferential intuition suffices. To establish the existence of a thing underlying thoughts, Descartes has two options. He might claim that, in being aware of his thoughts, he is directly aware of the substance in which they inhere. Or he might claim to know that thoughts – or indeed any attribute or activity – can exist only in a substance. He rejects the first option on the grounds that we never know substances directly but only through their acts or attributes (7:176, 222). The second option amounts to adding a premise, that thoughts, as instances of an activity, must inhere in a substance. Descartes in fact endorsed such a position (7:175–76, 222–23). It is, however, at least apparently inconsistent with our passage from the Second Replies. So let us consider additional passages that endorse an added premise.

The Letter to Clerselier (in response to Gassendi) allows that a major premise is presupposed:

> The author ... insists that when I say "I think, therefore I exist" I presuppose the major premise "Whatever thinks exists," and hence I have already adopted a preconceived opinion. Here he once again misuses the term "preconceived opinion." For although we can apply the term to the proposition in question when it is put forward without attention and believed to be true only because we remember that we judged it to be true previously, we cannot say that it is always a preconceived opinion. For when we examine it, it appears so evident to the understanding that we cannot but believe it, even though this may be the first time in our life that we have thought it.
>
> (9A:205)

Descartes does not question the need for the added premise, only that it amounts to a preconceived opinion. Moreover, in restating the argument for the *Principles*, he accepts the need for the premise (or, as he puts it, "simple notion"):

> when I said that the proposition "I am thinking, therefore I exist" is the first and most certain of all to occur to anyone who philosophizes in an orderly way, I did not in saying that deny that one must first know what thought, existence, and certainty are, and also that it is impossible that that which thinks should not exist, and so forth.
>
> (8A:8)

Adding the premise "Whatever thinks exists" to "I think" would allow a logically valid inference yielding "I exist." If we consider further that Descartes also affirms the conclusion "I exist as a thinking thing," then he needs a further premise introducing thinghood or substance. It occurs in the Third Replies: "no act or accident can exist without a substance to inhere in" (7:175–76). (Here, an "act" is an act of thought, and an "accident" is a property that something has but need not have had, such as having a particular thought at a particular time. Descartes is invoking a standard definition of substance, as the substratum for properties.)

Using this further premise, we have the following argument:

(1) I think
(2) Whatever thinks exists.

(3) No act or accident can exist without a substance to inhere in.
(4) Therefore, I exist as a substance that thinks (or a thinking thing).

Premises (2) and (3) would be regarded as tacitly held, in accordance with the *Principles* and Replies. (We could add a further premise: thinking is an act or accident, to make the argument fully explicit.) Premise (2) supports the initial conclusion about existence, and (3) underwrites the extended conclusion about a thinking thing. We have an inferential argument drawn from Descartes' elaborations of the *cogito*.

The addition of such premises invites the objection that the meditator cannot assert them, since she accepts that she knows nothing. "I exist" is supposed to be her first item of knowledge. If her mind has been cleared of all other judgments, whence do these premises arise? In the passage from the Letter, Descartes asserts that "whatever thinks exists … appears so evident to the understanding that we cannot but believe it." But in the Second Meditation he doesn't justify the premise or even express it, and he hasn't established that the meditator should believe what appears evident to her. In fact, he has had her call the evident truths of mathematics into question. So if he needs this premise for the *cogito* inference, it seems doomed.

Nonetheless, we believe the initial *cogito* result. So either it isn't an inference, or it must rely on yet other premises that can be legitimately presupposed, or there must be some way for the premises listed above to enter the argument legitimately.

In response to various queries (9A:205; Burman, 5:147), Descartes distinguished the (tacit) inferential structure of thought from explicit syllogistic reasoning as in the synthetic method. In essence, he argued that the judgment "I am thinking, therefore I exist" is intuitively evident as it stands but that this intuition is inferentially complex and contains an implicit major premise. (Recall that in the *Rules* Descartes allowed that intuitive acts of thought can contain inferential structure [10:408].) The conclusion "I exist" is first known in this intuitive way; with subsequent reflection, in the analytic mode, we realize that our judgment

implicitly contains premise (2). Further analysis discloses the extended conclusion and its reliance on (3).

Descartes explained these points with varying degrees of clarity. Perhaps the most concise explanation was recorded by Burman (5:147), who noted the apparent contradiction between the Second Replies (no syllogism) and the *Principles* passage from above (8A:8). Descartes replied:

> Before this inference, "I am thinking, therefore I exist," the major, "whatever thinks exists," can be known; for it is in reality prior to my inference and my inference depends on it. That is why the author says in the *Principles* that the major premise comes first, namely because it is always implicitly presupposed and prior; but he does not say that I am always expressly and explicitly aware of its priority and that I know it before my inference. This is because I am attending only to what I experience within myself – for example "I am thinking, therefore I exist." I do not pay attention in the same way to the general notion "whatever thinks exists." As I have explained before, we do not separate out these general propositions from the particular instances; rather, it is in the particular instances that we think of them.
>
> (5:147)

Descartes is making a point about the degree of explicit awareness one has in accepting a conclusion. Prior to reflection, reasoners may accept a conclusion without being fully aware of its basis, as contained in their thought. Accordingly, the major premise, whatever thinks exists, "comes first" logically, but it does not come first in the order of awareness or of legitimate argumentation. An intuitive but unanalyzed argument can be legitimate, since Descartes does not require that an argument's logical structure be made explicit (only that its transitions be sound). In reflecting on the *cogito*, we see that a major premise is presupposed and, upon considering the premise, we accept it. Indeed, if we see that it is presupposed by the *cogito* reasoning, we should accept it, since that reasoning is itself compelling and indubitable (so Descartes claims). In effect, Descartes is describing how things should proceed according to the analytic method.

We can now interpret the passage from the Second Replies, which says that the *cogito* conclusion is not deduced from a syllogism, because that would require "previous knowledge of the major premise." It then explains: "in fact he learns [the major premise] from experiencing in his own case that it is impossible that he should think without existing" (7:140).

Let us consider how the major premise "whatever thinks exists" might be learned from our own case. One possibility is that our case serves as a single piece of evidence that supports a universal premise by inductive enumeration, just as an observer might form a generalization about all rabbits (e.g., that they always twitch their noses before eating) by observing many rabbits, one at a time. That would be a normal Aristotelian way of forming the major premise of a universal syllogism. Note that in this case the major premise of the syllogism accepts the fact that, and, as a matter of logical form, indeed requires that, the rabbit exists.

It is unlikely that Descartes thought that we can learn the general proposition from our own case as a one-instance enumerative sample. This would be futile, since enumerative induction to a syllogistic major requires that the thinker exists, which is the matter in question. It is more likely that he conceived his major premise as expressing a conceptual relation between thinking and existence. It would say that if anything thinks, or performs any act whatever, it must exist, and that this is true whether anything actually thinks or acts at all. Accordingly, he calls this premise a "general" (or "simple") "notion" and says that such notions in themselves "provide no knowledge of what exists" (8A:8). The meditator would learn the premise from her own case by recognizing it as a conceptual truth implicit in the *cogito* reasoning. (On the difference between this type of premise and a syllogistic major premise, see the Appendix.)

In the Letter to Clerselier, Descartes situates this point in relation to the order and method of learning. The Letter accuses Gassendi of assimilating the *cogito* to a logical model in which "knowledge of particular propositions must always be deduced from universal ones, following the same order as syllogisms in Dialectic" (9A:205). The order in question is that of the synthetic method, which begins with explicitly stated general premises

and reaches particulars through deduction. The Letter continues its criticism:

> Here he shows how little he knows of the way in which we should search for the truth. For it is certain that if we are to discover the truth we must always begin with particular notions in order to arrive at general ones later on – even though we may in the reverse way, after having discovered the general ones, also deduce other particular truths from them. Thus when we teach a child the elements of geometry we will not be able to get him to understand the general proposition "When equal parts are taken from equal quantities the remainders are equal," or "The whole is greater than its parts," unless we show him examples in particular cases.
>
> (9A:205–6)

We know that Descartes held that such axioms as these – which were found in Euclid's geometry and accepted by all – can be known without appeal to sensory experience. He is not suggesting that the child learns them inductively by collecting individual cases. Rather, through examples that serve as instances of these general propositions, the child comes to see them as instantiated in a particular case. We also know (from Med. 5) that he believed that general statements in mathematics are known as conceptual truths, independently of the existence of their objects. Once the child sees the general proposition, he could recognize it as self-evidently true. And that is how the general premise "whatever thinks exists" allegedly is known: "it appears so evident to the understanding that we cannot but believe it, even though this may be the first time in our life that we have thought it" (9A:205). Presumably, because such conceptual connections are part of the very structure of thought, they are not suspect and can be used in the *cogito* reasoning.

This reading, which has the *cogito* inference legitimately accepted in a single intuition and subsequently analyzed to discover its logical structure, can help us with two points raised above. First, we noted that it would be odd for Descartes to accept the conclusion "I exist" as asserting bare existence of the meditator in complete separation from her nature as a thinking thing.

However, we also noticed that in preparation for concluding "I exist," the meditator accepted that her body and senses don't exist and also considered instances in which she has thoughts, doubts, and is deceived (7:24–25), all instances of "thinking" in Descartes' generic sense. So we may now suppose that using these thoughts to infer "I exist" colors that conclusion with a dim awareness of the meditator as a thinking thing. This awareness grows through further reflection on the role of thinking in the *cogito* reasoning (see 7:174, 352) and by investigating the "I." This interpretation sees the uncovering of the argument in the Second Meditation and the Replies as an instance of the analytic method, which here bears a similarity with philosophical analysis in a more contemporary sense, as the replacement of obscure thoughts with clarified ones.

Second, it offers a response to those who would simplify the argument, so that the meditator simply finds her existence presupposed by her acceptance that she doubts and is deceived. Any instances of acting or being affected would suffice for implying existence. True enough, but this misses the special role of thinking in the *cogito* reasoning. The meditator's acceptance that she acts or is affected are instances of the "I think"; doubting and being deceived require acts of thought (see 10:523). The meditator who undertakes the *cogito* reasoning has also accepted that she has "no senses and no body." For this reason, as Descartes explained to Gassendi, the inference "I am walking, therefore I exist" is not available. Only an *awareness* of walking (or of seeming to walk) would do the trick, since only it is a thought. Thinking has a special role in concluding "I exist," since the meditator is, at this point, only considering her own thoughts.

WHAT IS THE PURPOSE OF THE *COGITO*?

The initial conclusion of the *cogito* offers the meditator her first certainty about anything, namely, her own existence (at least as long as she is thinking). This certainty is itself of little moment. Its function is not to assure the meditator that she exists, as if that had been in serious question. Rather, it is supposed to lead to other truths, to "great things."

Some are foretold in the Meditation's title: "The nature of the human mind, and how it is better known than body" (7:23). One purpose of the *cogito* reasoning is to aid in achieving the knowledge here promised. The Synopsis assures that the "exercise" of radical doubt and of considering oneself as a thinking thing is "of the greatest benefit, since it enables the mind to distinguish without difficulty what belongs to itself, i.e., to an intellectual nature, from what belongs to body" (7:12*). Spurred by the *cogito*, investigation of the nature of mind unfolds in the remainder of the Meditation.

However, the Archimedean point of the *cogito* was supposed to yield even more. Elsewhere, Descartes characterized it as the first principle of his philosophy (6:32, 8A:6–7), from which all other knowledge flows (10:526). His interpreters have frequently wondered how a whole system of knowledge could arise from such a modest beginning. That depends on how the *cogito* relates to Descartes' subsequent conclusions. Three types of relation were sketched above: foundationalist, systematic, and methodological.

On the foundationalist picture, the *cogito* acts as a first principle from which the rest of Descartes' metaphysics is deduced. In the simplest version of this picture, the *cogito* conclusion serves as the single premise from which all further knowledge is derived. It is difficult to see how the *cogito* could fulfill this expectation. Another foundationalist answer downplays self-existence in favor of the meditator's immediate awareness of her thoughts, which serves as a foundation for all other knowledge. Descartes would have the meditator move from incorrigible knowledge of her own mental states to knowledge of the rest of the world. This picture is similar to the sense-data foundationalism of the early twentieth century, which held that all knowledge of the external world must be inferred (or constructed) from the immediately known objects of sensory experience. To work as a reading of Descartes, we would need to understand how awareness of one's own thoughts could yield additional knowledge without relying on further principles (discussed in Ch. 5).

On the systematicity view, the *cogito* conclusion comes implicitly linked to other knowledge. On the interpretation just presented, implicit premises were found lying behind the intuitive certainty

of one's own existence. This systematic knowledge included knowing what thought and existence are and that whatever thinks must exist. Perhaps other conclusions, not required for the *cogito* conclusion itself, might be found by considering what is presupposed in thinking of one's mind. An argument for the existence of God in the Third Meditation, starting from the awareness of a finite mind (as in the *Discourse*), fits this scenario.

Finally, in line with the methodological answer, we might find that the *cogito* result, by offering an instance of certain knowledge, reveals the proper method for attaining knowledge. With this answer, there is (in principle) no difficulty in explaining how the *cogito* finding could produce "great things." Once a general method of knowing was derived from the *cogito*, this method could be applied to other subject matter to yield a variety of metaphysical principles. Early in the Third Meditation, Descartes looks to the *cogito* in order to extract such a method.

NATURE OF "I" AS THINKING THING (7:25–27)

Immediately after achieving the initial conclusion "I exist," Descartes has the meditator remark:

> I do not yet have a sufficient understanding of what this "I" is that now necessarily exists. So I must be on my guard against carelessly taking something else to be me, and so going wrong in the very item of knowledge that I maintain is the most certain and evident of all.
>
> (7:25)

The meditator decides to "go back and meditate on what I originally believed myself to be." She formerly believed herself to be "a human being." She considers and rejects the Aristotelian definition of a human being as a "rational animal" because it requires "rational" and "animal" to be understood, necessitating further investigations and "subtleties" (contemplating the notion of animal would direct the meditator toward the now-abandoned material world). The meditator describes a "natural" and "spontaneous" conception of a human being, as someone with a body who is nourished, moves about, and has sense perceptions and

thoughts. In this natural or ordinary conception, the soul is conceived as a material thing, a "wind or fire or æther" (7:26; recall Descartes' early conception of soul, 10:217). Under the radical doubt, body, nourishment, motion of limbs, and sensory activity – all associated with the body – have been rejected.

What remains? Thought alone. It alone is "inseparable from me" (7:27). Descartes leads the meditator beyond her initial conclusion to the extended *cogito*:

> I am now admitting nothing except what is necessarily true. I am, then, in the strict sense only a thing that thinks; that is, I am a mind, or intelligence, or intellect, or reason – words whose meaning I have been ignorant of until now. Still, I am a thing that is real and that truly exists. But what kind of a thing? As I have said – a thinking thing.
>
> (7:27)

The "I" is a thinking thing, here equated with "a mind, or intelligence, or intellect, or reason." The extended conclusion yields an explicit insight into the nature of mind. In wending her way to this conclusion, the meditator has accomplished two things. First, she has separated any considerations of body or bodily processes from her conception of herself. The First Meditation doubt about all things bodily has allowed her to discount such activities as nutrition, stimulation of the sense organs, and muscle-driven motions of the body from her notion of herself as a certainly existing thing. But this allows her to discover, second, that the things she can't doubt, her own present thoughts, are in some way unified. She discovers that her thoughts, as isolated through the process of doubt, can be unified under the title of thinking (or the mental).

This discovery was of no small moment in Descartes' intellectual context. It marks the transition from the Aristotelian conception of soul – which included vegetative, sensory, and intellectual powers – to the Cartesian conception of mind. In the Aristotelian conception, mental functions are only part of the nature of soul. Even the human soul, although defined through its rational power, has the powers of nutrition, reproduction, muscular movement, and nervous transmission of sensory stimulation.

Descartes now purports to find a coherent concept of mind that excludes those bodily activities and focuses only on thoughts. (As we shall see, it includes sensations insofar as they are experiences, but excludes neural activity.) For this reason, he equated *soul* with *mind* and preferred the latter term to avoid ambiguity (7:356).

We must note exactly what Descartes does and does not claim for this finding about the nature of mind. He claims that the meditator's knowledge of herself is now restricted to thoughts and that these thoughts can be conceived without reference to body. As already mentioned (and further discussed below), he does not claim that she can know whether human thoughts or a human mind can exist apart from a body. Correspondingly, she presumably cannot know at this point whether mind actually directs the processes of digestion, or provides the active power that contracts the muscles. Such questions are beyond the Second Meditation.

Descartes has it that the act of focusing on her own thoughts, stripped of bodily reference, permits the meditator new insight into mind or intellect, for she says that these are "words whose meaning I have been ignorant of until now" (7:27). In part, this must mean that she was ignorant of mind because she had thought of it as involving body. But now she has learned to contemplate thoughts without knowingly invoking the body. Further questions can now be posed, about how the mind exactly is known and what is known about its relation to body.

MIND'S RELATION TO BODY UNKNOWN (7:27); MIND ITSELF NOT IMAGEABLE (7:27–28)

In the continuing investigation of the "I," Descartes has the meditator explore the cognitive faculty by which the "I" is known. First he has her try to imagine the "I" as a thinking thing. She rules out images of those things that she formerly considered a thinking thing to be: "wind, fire, vapor, breath" (7:27). She is now supposing that no bodies exist, not even air or fine matter, yet she still knows herself as a thinking thing. This fact suggests that she cannot be known to herself by means of imagination, which is literally a faculty of images; as Descartes has her recall,

"imagining is nothing other than contemplating the shape or image of a corporeal thing" (7:28). She cannot use the faculty of imagination to form an image of the "I," for things that can be imaged are by definition bodies, that is, things that have "a determinable shape and a definable location" (7:26). She concludes:

> I thus realize that none of the things that the imagination enables me to grasp applies to this knowledge of myself that I possess, and that the mind must therefore be most carefully diverted from such things if it is to perceive its own nature as distinctly as possible.
>
> (7:28)

The mind can become aware of itself or its states, but trying to picture those states won't help.

Descartes is not saying that individual acts of imagination, as experiences, are irrelevant to grasping the nature of mind. Imagistic experiences, as in a dream, or in imagining a sleeping cat, count as instances of thinking and hence as activities of the mind as a "thinking thing." But in the present case, the meditator is trying to discover what the "I" is (7:25, 27) by representing the thinking thing in itself (as opposed to experiencing its thoughts from the inside, as it were). She is attempting to take a third-person or observer's perspective on the thinking thing, which she knows thus far only from her first-person experience of thinking (i.e., having thoughts). And this attempt to imagine or picture the "I" from a third-person perspective fails. In this context, use of the imagination (and senses) is deemed irrelevant to grasping the nature of the thinking thing.

As noted before, Descartes did not think that the meditator could at this point know whether mind is identical with body. The presumed fact that she can *think of* mind without thinking of body does not reveal how mind *is* actually related to body. She asks: "may it not be that the very things that I am supposing to be nothing, because they are unknown to me, are yet in reality not different from the 'I' that I know?" To which she answers: "I do not know, and for now I am not arguing the point, since I can make judgments only about things that are known to me" (7:27).

VARIETY AND UNITY OF THOUGHTS (7:28–29)

Having determined that the "I" is a thinking thing, the meditator now asks what this "thing that thinks" is (7:28). The answer comes as a list of its activities: it is "a thing that doubts, understands, affirms, denies, is willing, is unwilling, and also imagines and has sensory perceptions" (7:28). Thinking comprises a variety of activities, including understanding, willing, and having sense perceptions. (As noted above, Descartes applied the terms "thought" and "thinking" broadly, to refer to any mental state or activity.)

Does anything unify this list? Is there something all thoughts share? Famously, Descartes held that all thoughts are accessible to consciousness, and he has been interpreted as equating the essence of thought with consciousness. So far, he has not invoked consciousness in describing the nature of thought, and he did not use the term "conscious" in the Second Meditation. Among the six Meditations, it occurs only in the Third (7:49*), and then not to define thought.

Nonetheless, in accordance with the list given above, accessibility to consciousness provides a means for delimiting the domain of thought. Consider that the list now includes sense perception, which had been excluded from what the meditator knows (7:27). Sense perception, as also imagining, is here considered without respect to bodily or nervous activity; it is considered merely as a type of experience the meditator has. Even though the meditator now supposes that she has no body or sense organs, and that the objects of imagination do not exist, she still has the conscious experiences known as sensing and imagining, which she counts among her thoughts.

Availability in consciousness also provides the grounds for considering all the various types of thought to be activities of one and the same thinking thing:

> Is it not one and the same "I" who is now doubting almost everything, who nonetheless understands some things, who affirms that this one thing is true, denies everything else, desires to know more, is unwilling to be deceived, imagines many things even involuntarily,

> and notices many things as if coming from the senses? Are not all these things just as true as the fact that I exist, even if I am asleep all the time, and even if he who created me is doing all he can to deceive me? Which of all these activities is distinct from my thinking? Which of them can be said to be separate from myself? The fact that it is I who am doubting and understanding and willing is so evident that I see no way of explaining it more clearly.
>
> (7:28–29)

It cannot be any clearer that these various types of activity belong to one domain of thought, and to one thinker, so that all of them are hers. What makes them all hers? Apparently, the fact that she is directly aware of the various thoughts.

The unity of various types of thought in a single mind is a new, enlarged result of the *cogito* investigation. It addresses a point raised earlier in connection with the thin reading. We wondered how, on the thin reading, we could move beyond separate instances of "thinking going on" to talk about an "I." It was proposed that awareness of thoughts as connected together, or as occurring sequentially in the same consciousness, could support the minimal claim that the stream of thoughts belong together and constitute the "I" in "I exist." Now we have the claim of unity explicitly advanced, on phenomenal grounds that appeal to a stream of consciousness. All the same, Descartes here portrays the "I" as something more substantial, as the subject of activities that are acts of thinking. So, although the thin reading might persevere in connection with the unity of thoughts, it does not capture Descartes' conception of the "I."

Let us grant that the meditator recognizes various instances of thought as belonging to her in one consciousness. Do we have reason to believe that she has access to all her thoughts? It seems not. That is, at best she now has access only to those thoughts found in consciousness. That may include all thoughts, but it may not. More generally, we have no reason (as yet) to believe that the meditator's list of types of thought is complete. That is, we don't know whether the list is simply experientially based and merely enumerates the types of thought the meditator has thus far discovered in herself, or whether it anticipates a theoretical

taxonomy based on a further insight into the nature of thought. These questions await further progress.

Although the meditator finds it immediately obvious that the various types of thinking, and instances of thought, are all hers, this finding need not show what makes all these activities types of thought, and hence all mental. And, indeed, we may ask whether thoughts have a common feature besides belonging to one thinker.

The Geometrical Arguments contain a frequently cited definition of the term "thought" in relation to consciousness:

> *Thought*. I use this term to include everything that is in us in such a way that we are immediately conscious of it. Thus all the operations of the will, the intellect, the imagination, and the senses are thoughts. (7:160*)

If we take Descartes here to be defining the essence of thought, as consciousness, then we have discovered that essence – and the nature of the thinking thing – tacitly invoked in the Second Meditation in connection with the unity of thoughts. But we must be careful. This quotation merely says how he defines the word "thought," not what the essence of thought is. And there is a well-known sense of "definition" that means setting the domain of application of a word (we might say its "extension"), rather than describing the essence of what is so defined. This definition may do no more than is achieved by the epistemic isolation of thoughts in the Second Meditation; that is, it may simply circumscribe the domain of characteristic mental activities (will, intellect, etc.) by appealing to the fact that we are "immediately conscious" of them all.

Granted that consciously available thoughts are all the meditator now knows, we may still ask what makes them all instances of thought. Is it simply a bare fact that they are all thoughts? Does consciousness provide a unifying essence? Or is there some further property or properties that constitute the essence of thinking?

One way to think about these questions is by considering the charge (leveled by later philosophers) that Descartes simply

lumped together a hodgepodge of activities under the title of "thought" or "the mental," using consciousness as an arbitrary criterion. According to this criticism, sensing, imagining, understanding, and willing don't really share a common nature. They are simply four activities of which human beings have immediate awareness.

Yet Descartes has promised to reveal "the nature" of the human mind, or thinking thing. Earlier in the Meditation, he equated a "thing that thinks" with a "mind, or intelligence, or intellect, or reason" (7:27). This suggests a new answer to our question. Intellect (or reason) is the essential feature of the thinking thing; it provides us with the nature of thought. And, indeed, in the Sixth Meditation, Descartes equates the "I" with an "intellectual substance" (7:78). This equation is not unproblematic, since in the Fourth Meditation (7:57–58) Descartes distinguishes intellect from will as types of mental power (see also 8A:17), and it would be difficult to suppose that having a will is not essential to a Cartesian mind. Still, going forward, we should keep in mind the possibility that, for Descartes, intellection, not consciousness, is the most basic attribute of mind.

WAX ARGUMENT – KNOWLEDGE OF BODY (7:29–33)

Having arrived at an enlarged conception of the thinking thing, Descartes has the meditator pause and change scenes. Up to this point she has accepted that states of mind can be known, while the existence of body remains in doubt. She accepts that the *existence* of a thinking thing is better known than the existence of body, but Descartes has promised to show that the *nature* of mind is better known than that of body.

To focus the meditator on the natures of mind and body, Descartes frames a supposedly nagging question:

> But it still seems – and I cannot stop thinking this – that corporeal things, of which images are formed in thought and which the senses themselves investigate, are known with much more distinctness than

> that part of me – I know not what – which does not fall under the imagination.
>
> (7:29)

In fact, in this Meditation, the meditator has not protested on behalf of bodies but has dutifully doubted their existence. This newly framed worry, which acknowledges a reservation that readers might have, serves two functions. First, it raises a question about the comparative knowledge of the natures of mind and body. Second, it frames this question in relation to the cognitive faculties by which mind and body are known.

Earlier, Descartes presented considerations to convince the meditator that mind is not known through images or the imagination. He now raises a small protest against this point by characterizing this unimaginable part of himself, this "I," as unknown. Recall that the meditator, whether an Aristotelian or an untutored person of good sense, previously thought of both mind and body using the imagination. More generally, she had considered the senses and imagination to be essential in all knowledge. Descartes now intends to lay this preconceived opinion to rest.

Descartes returns to a topic from the First Meditation, our knowledge of "the bodies we touch and see." The meditator is not asked to reconsider whether such bodies exist; rather, she is to consider how, or whether, she "comprehends" them. In this context, to comprehend a body is to know what it is. Descartes presents individual bodies as "the things that are commonly thought to be comprehended most distinctly of all" (7:30). True, as a result of the First Meditation the meditator now considers bodies to be "doubtful, unknown, and foreign to me" (7:29). But, for this new investigation, she is permitted her old belief that bodies are distinctly known and is allowed to assume that she sees and touches actual bodies.

There is no harm or inconsistency in allowing the meditator to suppose that she can see and touch bodies. The matter in question does not concern the existence of bodies. Rather, the meditator is undertaking a thought experiment concerning the nature of body.

The argument to show that the nature of mind is better understood than that of body is an indirect proof. Descartes has

the meditator grant an opposing assumption – that bodies are known better ("more distinctly") than mind because we have images of them. He then attempts to show two things. First, that even the nature of body, or what a body is, is not known through images. Second, that this finding shows that the nature of mind is better known than that of body.

PERCEIVING THE WAX

The investigation to determine what is distinctly comprehended in body focuses on a particular body, a piece of beeswax just taken from a honeycomb. (Although Descartes focuses the meditator on a piece of wax, her task is to investigate bodies more generally; the wax is just an example.) The wax retains the flavor of honey and the scent of flowers, is cold and hard, makes a sound when tapped, and has a particular color, shape, and size (7:30). When placed by the fire, however, all these properties change: it loses its flavor and scent, changes color, becomes liquid and hot, and alters its shape and size as it melts into a small puddle.

Through all these changes, we consider ourselves to be perceiving the same wax.

> Does the same wax remain? It must be admitted that it does; no one denies it, no one thinks otherwise. So what was it in the wax that was so distinctly grasped? Evidently none of the features that I arrived at by means of the senses; for whatever came under taste, smell, sight, touch, or hearing has now altered – yet the wax remains.
>
> (7:30)

Whatever we comprehend in the wax must be in it both before and after it melts. Even though the wax changes all the properties we sensed in it, we grasp that it is the same stuff. So the meditator sets out to find what is known in the piece of wax despite such changes.

FINDING WHAT IS COMPREHENDED IN THE WAX

The meditator carefully looks for what persists in the wax throughout the changes:

> Perhaps what I distinctly grasped is what I now think: namely, that the wax itself was not at all that sweetness of the honey, or that fragrance of the flowers, or that whiteness, or that shape, or that sound, but was rather a body that appeared to me a little while ago as perceptible in these ways and now appears otherwise. But what is it exactly that I am now imagining? Let us concentrate, take away everything that does not belong to the wax, and see what remains: merely something extended, flexible, and changeable.
>
> (7:30–31)

What the wax is – its nature – will be something it always has, not something it loses if heated or reshaped. And, indeed, although its sensory properties changed, it remained an instance of "body" throughout. So perhaps what is grasped in a body is more basic than any of those sensory properties. The meditator isolates what was comprehended through the changes and finds that the wax is something "extended, flexible, and changeable." "Extension" just means that the wax has spatial extent. "Flexible" and "changeable" mean that it has the capacity to change shape, size, and perhaps other properties (although Descartes focuses on only shape and size, where size means the apparent size of its outer boundary).

Careful contemplation of the wax has purportedly shown that its determinable spatial properties – its extension, its capacity to have a size and shape – remain, even when other properties, including the way in which it is extended (e.g., its determinate shape, or its degree of rigidity) change. (The word "determinable" is used to refer to the fact that a property can have many instances without referring to any one of them; the word "determinate" indicates that some particular instance, such as a specific size or shape, is referred to.)

The wax certainly does have, as we would now say, spatio-temporal continuity. It has spatial extension, which changes in location, size, and shape over time. When Descartes says it is "extended, flexible, and changeable," the latter two words suggest that it, the wax, is capable of many changes of shape, across which it remains the same. However, an Aristotelian or an untutored person of good sense might observe that the wax is also capable of taking on various colors, odors, and temperatures.

When it melts, it doesn't completely lose all color and odor; rather, it becomes a translucent, whitish material with a waxy odor. So why doesn't Descartes find that it is "changeable" as regards color, odor, temperature, etc.? Why focus on the bare spatial properties as what is understood in bodies?

Consider Descartes' thought experiment for yourself. In doing so, you must ignore scientific knowledge subsequent to the time of Descartes: knowledge that mass is a fundamental property of matter, that different kinds of matter differ in specific gravity and in chemical composition, that beeswax is a complex hydrocarbon in which some other compounds are suspended, etc. Now think about the transformation of the wax as it melts. It seems right that we clearly grasp the wax, through its changes, as a bounded region that alters shape and size. That part of his positive result is sustained. But do we not also see that it remains determinable as regards color and temperature? That is not ruled out. But are these properties understood with great "distinctness" (7:30)? Do we understand the property of the wax that renders it determinable as regards color with the same clarity as we understand its mutability as regards its overall shape?

The thought experiment does not definitively answer this question. It remains open for now. But we should recall that Descartes' audience – whether an Aristotelian or an educated person of good sense – would be familiar with Euclid's geometry. Geometry was at the core of mathematical education and served as the paradigm of intelligibility. Perhaps Descartes was relying on an intuitive clarity in the notion of "capable of changes of shape" that he expected not to be found in "capable of changes of color." That might draw in his opponent for a moment. But, in fact, he moves on to a potentially more devastating argument, according to which the sensory images of the wax – which were supposed to allow it to be known with such distinctness – do not permit us to grasp its nature at all.

DISCOVERING HOW THE WAX IS UNDERSTOOD

In contemplating the wax the meditator has thus far concluded that its nature consists in a determinable extension that can alter

its determinate spatial properties over time. How is this property, the wax's mutable extension, perceived? Is it perceived by sight or touch? Is it grasped through the imagination, by picturing the various changes in shape that are possible? Descartes answers "no" in both cases, and in so doing he purports to arrive at a new insight into how the wax is known and also into the mind that knows the wax.

He offers the meditator an argument from elimination, which seeks to rule out the imagination as the faculty that grasps the mutability of the wax's extension. The argument involves a further examination of the wax's mutable shape:

> But what is this: "flexible" and "changeable"? Is it what I can imagine, that this piece of wax is capable of changing from a round shape to a square shape, or from a square shape to a triangular shape? Not at all: for I can grasp that the wax is capable of countless changes of this kind, yet I am unable to run through this immeasurable number of changes in my imagination, from which it follows that it is not the faculty of imagination that gives me my grasp of the wax as flexible and changeable.
>
> (7:31)

One key premise is the claim that "I can grasp that the wax is capable of countless changes of this kind." The meditator is supposed to discover this premise through her own understanding of the wax – that, as a flexible extended thing, it can take on indefinitely many shapes. A second key premise is that the imagination cannot "run through," that is, separately imagine, each member in the full series of shapes. A further implicit premise is that the imagination, as a faculty of images, could allow us to grasp this series only by picturing each member individually. But it is unable to. Hence the imagination is not the faculty by which we grasp the nature of the wax (now considered simply as a mutable body).

Thus far, the argument rules out the imagination as the faculty by which the wax is grasped. What is left? The argument from elimination now comes in. The imagination is unable to represent the changes. The senses represent even fewer shapes (the ones the

wax actually assumes). Nonetheless, we grasp the wax's ability to undergo countless changes. How? The answer comes: "by the mind alone" (7:31).

This answer requires explanation, which will lead us to a difference in how Descartes and an Aristotelian conceive of the intellect, that is, of a faculty beyond the imagination. In preparation, let us consider the argument as it might be evaluated by an Aristotelian. The argument can be formulated as follows:

(1) I can grasp that this melted wax is flexible and changeable so as to be capable of innumerable changes of shape.
(2) Imagination could allow me to grasp this fact only by representing these changes by an image of each possible shape.
(3) My imagination cannot represent the innumerable shapes required.
(4) It is not the imagination that allows me to grasp this capability of the wax.
(5) But I do grasp this capability, so it must be by a faculty other than (sense or) imagination: call it the mind itself.

Although the meditator is supposed to accept premise (1) by reflecting on the melting episode, that episode as perceived by sense cannot be its sole support. The Second Meditation does not make clear whether (1) might be based on many observations of wax and other bodies or must itself arise through a purely intellectual perception of bodies as extended. An Aristotelian would claim that (1) is grounded in previous experience, which permits the intellect to grasp the mutability of the wax. He might further grant premises (2) to (4) but observe that, in his view, a finite sequence of images would provide the intellect with sufficient basis on which to abstract the intelligible extension of the wax. He might then add a few premises of his own (about all thoughts requiring images) and rephrase the conclusion (5) to say: "I grasp this capability through the intellect, which must use the images in the imagination."

An Aristotelian would find other aspects of the larger wax discussion misdirected. According to an Aristotelian account, to grasp

the nature of the wax, one would need to grasp its substantial form, which wouldn't even include extension, flexibility, and mutability (since the Aristotelians considered extension to be a universally present accident in bodies but not part of their essence), but would include the qualities of the wax (the hot, cold, wet, and dry of the elements, and others). Moreover, he would expect to grasp one nature in wax and another in other types of body. However, Descartes has explicitly characterized the piece of wax as a representative example of how any type of body is understood (7:30). To the extent that the wax argument supports the claim that what is distinctly known in the wax is simply extended body, it provides a beginning for Descartes' argument that extension is the essence of all material substance and hence of all bodies. But it does not itself establish that conclusion, and Descartes avoids claiming that it does (7:175).

Returning to the conclusion of the argument, the claim that "the mind alone" grasps the nature of the wax is at first enigmatic. Descartes immediately elaborates on it. He says that our perception of the nature of the wax "is a case not of vision or touch or imagination – nor has it ever been, despite previous appearances – but of purely mental inspection" (7:31). Such inspection can be "imperfect and confused, as it was before" – presumably, when the mind was using the senses and imagination to try to understand the nature of the wax – "or clear and distinct, as it is now, depending on how carefully I attend to what the wax consists in" (7:31). To the Aristotelian and the untutored person of good sense, each of whom believes that the senses and imagination are always involved in thoughts about bodies, this would truly be a revelation. As Descartes has it, even when we use the senses to see the wax, we grasp "what the wax consists in" through the mind alone.

Near the end of this Meditation, Descartes provides the meditator with a name for the faculty by which this mental scrutiny takes place – it is the intellect (7:34), which is what he means by "the mind alone." In the meantime, however, he considers an objection that arises from how we speak about the relation between sense perception and acts of judgment (involving intellect).

ANALYSIS OF PERCEPTUAL JUDGMENT (7:32)

We usually think of philosophy as something that exists through words, whether written or spoken. In recent times, some philosophers and other thinkers have held that thought (or at least theoretical thought as found in science and metaphysics) can occur only through language. Whether one accepts this position or not, Descartes did not hold it. He agreed that language is used to express thoughts, but he conceived of the thoughts as having their own mental standing, independent of language. Acts of contemplation or meditation go on, as he puts it, "within myself, silently and without a word" (7:31–32*).

Nonetheless, in considering how the topic of sense perception is normally discussed in words, Descartes sees a problem: "the words themselves bring me up short, and I am almost tricked by the use of speech" (7:32). The problem arises because, although the meditator has concluded that seeing the wax and grasping its nature are accomplished not by the eyes but by "the mind alone," that does not accord with what we say:

> We say that we see the wax itself, if it is there, not that we judge it to be there from its color or shape; and this might lead me to conclude straightaway that the wax is known through what the eye sees and not by a purely mental inspection.
>
> (7:32)

That is, ordinarily we say that, through vision (or other senses), we are immediately aware of objects in our surroundings, whether wax, a table, or a friend who calls us away from meditation. And we experience them as being wax, a table, or a friend. Isn't this a purely sensory matter?

Descartes contends that it is not. Recognizing something as wax, a table, or a friend, requires an additional mental act beyond experiencing the images of the senses. He observes:

> If I look out of the window and see people passing in the street, as I just happen to have done, I normally say that I see the people

> themselves, just as I say that I see the wax. Yet do I see any more than hats and coats that could conceal automatons? I judge that they are human beings. And so something which I thought I was seeing with my eyes is in fact grasped solely by the faculty of judgment which is in my mind.
>
> (7:32)

It may happen, in observing people who are walking away from us in chilly weather, that we see only their clothing: hats and coats. Yet we say we "see" the people themselves. Our perceptual image is consistent with our seeing mechanical constructions, now called robots, that have been clothed and made to walk like people. Given that the sensory image might be the same in either case, what makes our current sensory experience (rightly or wrongly) possess the content that they are people? Descartes locates the added content, beyond the bare image, in a judgment. We (tacitly, it seems) judge that human beings are before us. Indeed, Descartes believed that much of the content we ordinarily ascribe to bare sense perception results from tacitly made judgments (Chs. 8–9).

In this example, as with the wax, Descartes speaks of grasping an object of perception "solely by the faculty of judgment" as opposed to seeing it with the eyes. It might therefore seem that he is saying, even in seeing a particular piece of wax, or people in the square, that the eyes (or visual experience, considered simply as an experienced image) play no role. That would be an odd position, for it would assert that we can perceive a particular piece of wax, or people in the square, without any sensory input! That is not Descartes' point. He is saying that the purely sensory component of perception, which he equates with the sensory images of things (the spatially organized array of colors we experience in a scene), cannot constitute our perception of the nature of the piece of wax or of the fact that human beings are present. For these richer perceptual achievements, a judging mind or intellect is required, beyond the bare image. (As discussed in Ch. 6, the will is also required for judgment to occur, but that doesn't affect the present point about the necessary role of intellect.)

Moreover, Descartes tells us, it is this intellectual capacity that separates human beings from animals. He places mere sensory and imaginal representation on the level of nonhuman animals; the perception of the nature of the wax as distinct "from its outward forms" requires a human mind (7:32). This contrast would not have been lost on his audience. The standard view was that humans differ from animals precisely in the possession of intellect or reason. We will see later (Ch. 9) that Descartes denied sensory awareness to animals. According to his theory, sensory awareness occurs only in beings possessing an intellect. The relation between sensation and intellection is further examined in Meditation 6.

MIND BETTER KNOWN THAN BODY (7:33–34)

Descartes now applies these considerations to the project of knowing the "I." The analysis of the perception of wax reveals that mind is better known than body in at least two ways. First, its existence is more firmly known: "if I judge that the wax exists from the fact that I see it, certainly this same fact entails much more evidently that I myself also exist" (7:33). Any act of perceiving a body provides evidence for the existence of mind, since a mind is required for perception. (At this point, we still don't know whether mind differs from body; but it remains that a mind is required for knowing wax, and hence that this mind's existence is known.) However, it is difficult to see why the wax argument would be needed to make this point, since he had already established earlier that instances of putative seeing provide evidence for the existence of mind (7:28–29). (See also Gassendi's Objections, 7:273–77, and Descartes' Replies, 7:359–61.)

However, the fact that seeing (or perhaps only seeming to see) the wax and the people in the street involves judgment points the way to a second, deeper point, going beyond the mind's existence to reveal a defining aspect of mind. The new finding arrives in two consecutive passages that conclude both the wax example and the entire investigation of the "I" in the Second Meditation. The first passage continues the argument that the existence of mind is proved by any act of perception, including touching the wax or imagining it. In each case, it follows "that I

who am now thinking" exist. Descartes proposes that such results also reveal the nature of mind:

> Moreover, if my perception of the wax seemed more distinct after it became known to me not just by sight or touch but by many other causes, it must be admitted that I now know myself even more distinctly. This is because every consideration whatsoever which contributes to my perception of the wax, or of any other body, cannot but establish even more effectively the nature of my own mind. But besides this, there is so much else in the mind itself that can render my knowledge of it more distinct that what comes from bodily things hardly seems worth listing.
>
> (7:33)

Two claims of great moment are made here. First, Descartes says that every case of perceiving the wax, in any manner – he has mentioned sight, touch, and imagination – establishes "even more effectively the nature of my own mind." How each case does so is not immediately apparent. Presumably, the nature of the mind is revealed through having sensory experiences and imagining the wax because these instances share something in common. After all, the meditator is not now first becoming aware of the variety of types of thought (she has explored that variety already); rather, she is seeking the nature of mind. What is common to the various cases of perceiving the wax, whether by sight, touch, imagination, or the "mind alone"? Consciousness would be one candidate, but Descartes does not mention it. He has just mentioned that a judgment of the intellect must be ascribed to each of these acts of perceiving wax, or any other body. Indeed, he has argued at some length that (intellectual) judgment is an essential property of mind present in any act of perceiving the wax.

The second important claim is that there is "much else in the mind itself," beyond sense perceptions and imaginings, that would allow it to be known distinctly. Sense perception and imagination take bodies as their object. The things "in the mind itself" presumably go beyond the images experienced in perceiving bodies. Here at the end of the Meditation, we are looking for an explanation of how the mind, which cannot be pictured, is better

known than body (7:29–30). Again, the primary things found "in the mind itself" are the judgments of the intellect involved in every act of perception of any sort, whether involving sensory images or contemplation of the variety of types of thought (including doubting, willing, affirming, denying). Our knowledge of such judgments, and hence of the judging mind, is over and above, or outside, images.

The second passage sums up the results of the investigation of the "I":

> And I see that I have spontaneously returned to where I wanted to be. For I now know that even bodies are not strictly perceived by the senses or the faculty of imagination but by the intellect alone, and that this perception derives not from their being touched or seen but from their being understood; and I plainly recognize that nothing can be more easily or evidently perceived by me than my own mind.
>
> (7:34)

The fact that any genuine perception of bodies depends on "the intellect alone" permits a "perception" of the meditator's own mind. What sort of perception? That it exists? This was established early in the Meditation, and the title has promised an insight into "the nature of the human mind." Although Descartes is not fully explicit about what this perception of the mind reveals, our investigation suggests it reveals that judgment and intellect are essential properties of the mind or are required for a human mind. In the Synopsis (7:12), Descartes promised that the Second Meditation would enable the mind to differentiate its own "intellectual nature" from things that belong to bodies (without establishing whether an intellectual nature can also be material). As the Meditations continue, we will see that in the pervasive functioning of the intellect in human cognition, Descartes believed he had discovered the essential feature of the human mind, the common element in its nature.

THE *COGITO* INVESTIGATION

The Second Meditation may be seen as one long investigation into the nature of the "I." This investigation begins with the very

manner in which "I exist" is established (by denying the body and becoming aware that thoughts remain). It examines both the "I" itself and how it is known. An early result is that the "I" can be conceived independently of any thought of bodily processes (such as digestion, locomotion, or the activity of sense organs). The inquiry then turns to the faculties by which both mental and bodily things are known. This second line of inquiry unites with the primary investigation at the end of the Meditation, in the discovery that the intellect, by which the "I" is grasped and which is implicated in every act of sense perception, is fundamental to the "I" as known thus far.

The *cogito* investigation can be summed up through four conclusions, from the initial to the final result. Each conclusion starts from and expands a previous result. The initial conclusion begins from an awareness of the meditator's own thoughts:

Initial conclusion: I exist.
Extended conclusion: I exist as a thinking thing.
Enlarged conclusion: A thinking thing is a thing that doubts, understands, affirms, denies, is willing or unwilling, imagines, and has sensory perceptions.
Final result: The intellect is an essential feature of myself as a mind, and of all mental activities.

The *cogito* reasoning is completed only with the final result.

Descartes believed that the final result, awareness of an intellectual faculty that can know things independently of images, would be difficult for his readers to grasp. As he explained in the Second Replies, "protracted and repeated study is required to eradicate the lifelong habit of confusing things related to the intellect with corporeal things, and to replace it with the opposite habit of distinguishing the two." The effort to do so, which should take at least "a few days to acquire," is worthwhile because it is needed in distinguishing "the properties or qualities of mind" from "the qualities of body" (7:131). The latter distinction – which arises in the Second Meditation through the exercise of doubting body while affirming mind, and the further exercise of seeing how the natures of both mind and body are understood – subsequently

serves as a basis for the real distinction between mind and body. The Second Meditation does not reach that far. It is devoted to teaching the meditator to achieve awareness of the mind as something that can be known without thinking of bodily attributes or processes, and of intellect as the faculty that cognizes "intellectual things" without contemplating images. In the Third Meditation, Descartes will contend that not only the mind or soul but also God is cognized through the pure intellect. And in the Sixth Meditation, he will argue that extension, or the essence of matter, can also be cognized in this way, as well as through the images of sense perception and imagination.

REFERENCES AND FURTHER READING

The *cogito* reasoning, usually restricted to the initial and extended results, has been extensively analyzed, as have the "thinking thing" and the wax argument; see the commentaries of Carriero, Curley, Dicker, and Wilson. Rubin, ch. 4, efficiently surveys recent work on the *cogito*, before supporting weak vindication. Peter Markie, "The Cogito and Its Importance," in Cottingham, *Cambridge Companion to Descartes* (Cambridge: Cambridge University Press, 1992), 140–73, examines some main interpretations.

Broughton, ch. 7, explores doubting and being deceived as acts presupposed in Meditation 1 which can establish the meditator's existence. Secada, ch. 1, highlights Descartes' essentialism (giving precedence to knowledge of essence) and its relation to the *cogito*.

B. Williams, ch. 3, examines Lichtenberg's challenge as it has been interpreted in philosophical tradition (I also follow the traditional understanding); further, he distinguishes Descartes' general premise from a syllogistic major premise. For discussion of Lichtenberg's aphorism, see J. P. Stern, *Lichtenberg: A Doctrine of Scattered Occasions Reconstructed from His Aphorisms and Reflections* (Bloomington: Indiana University Press, 1959), 270, 314.

Some commentators (e.g., Carriero, 75) falsely assert that the Latin phrase *cogito, ergo sum* is not found in the *Meditations*; in the Second Replies (7:140), Descartes paraphrases the Second

Meditation reasoning as: *ego cogito, ergo sum, sive existo* ("I am thinking, therefore I am, or I exist").

On the meaning of "definition" as delimiting a domain of application (among other meanings), see the glossary by J. J. E. Gracia in his translation of Francisco Suárez, *On Individuation* (Milwaukee: Marquette University Press, 1982), 175–279, at 200–201. This glossary explains much of the vocabulary of scholastic Aristotelianism, which Descartes knew and adapted to his needs. For instance, in Aristotelian philosophy the term "nature" might mean a principle of motion or activity, and in other contexts it might mean essence or common nature. Descartes may well have been trading on both meanings in revealing the "nature" of mind (its characteristic activities) in the present Meditation, although he only fully arrived at its essence as a substance in the Sixth Meditation. (Elsewhere, as in the Fifth Meditation, he uses "essence" and "nature" interchangeably.)

Study of the place of consciousness in Descartes' philosophy has been rendered difficult for readers of English translations. Anscombe and Geach, in *Descartes: Philosophical Writings*, translate the Latin *cogitatio* (thinking, a thought) and related words as "consciousness" or "experience." Conversely, CSM doesn't offer "conscious" for the Latin *conscius* but instead uses "aware" (7:49), and offers "consciousness" for *conscientia* only sometimes (7:176), elsewhere giving "awareness" (7:352, 559), which it also uses for more frequently occurring words, such as *animadvertere* (to notice, to attend to) or *cognoscere* (to cognize, to know). My translations stay closer to the Latin. In any case, study of local word usage won't settle questions about consciousness and the essence of thought in Descartes; the reader should consider the issue in light of Descartes' systematic presentation of his metaphysics and avoid putting great weight on single words without consulting the original language editions.

M. Williams, "Descartes and Doubt," has Descartes positing incorrigibly known contents of (sensory) consciousness as building blocks for subsequent knowledge, like the sense-data of early twentieth-century philosophy. In fact, classical conceptions of sense-data differ from Descartes' conception of sensory knowledge on two fronts. First, Descartes did not place great reliance on

sense perception for revealing the fundamental properties of things. Second, whereas the contents of sense perceptions are mental for Descartes, the sense-data of G. E. Moore, Bertrand Russell, and C. D. Broad are extramental, on which, see G. Hatfield, "Perception and Sense-Data," in Michael Beaney (ed.), *Oxford Handbook of the History of Analytical Philosophy* (Oxford: Oxford University Press, 2013), 948–74.

5

TRUTH, GOD, AND THE CIRCLE

MEDITATION 3: THE EXISTENCE OF GOD

The Third Meditation promises to establish a metaphysical result, "the existence of God." It offers two proofs of that result, both from effects. Each proof argues that a known effect can be explained only if a supreme being exists. The effects are the meditator's idea of God and her existence as a finite being.

However, the Meditation is by no means limited to God's existence. It begins by re-examining the *cogito* reasoning, hoping to extract from that first success a method for coming to know other truths with equal certainty. It reconsiders the deceiving-God hypothesis, finally rejecting it at the end of the Meditation because God's perfection rules out such deception. In preparation for the proofs from effects, it analyzes the notion of an idea and offers a theory of ideas and their content. It also draws an important distinction between the "teachings of nature" and "natural light." This distinction is used in evaluating the origins of the meditator's ideas and, in the Sixth Meditation, in rehabilitating the role of the senses in human cognition.

This chapter focuses on the extraction of a rule for recognizing truth, the rule's relation to the natural light, and the theory of ideas as developed in proving the existence of God. Concerning these items, some charge Descartes with circularity: for using clear and distinct perception to prove the existence of God and then invoking God's existence and perfection to validate clear and distinct perception. We examine this important challenge in this chapter and Chapter 7.

REVIEW: DOUBTS BODY, KNOWS MIND (7:34–35)

The reviews starting each new meditation refocus the investigation in light of preceding results. The present review recalls the meditator's knowledge of her own thoughts and existence and reaffirms her intent to "withdraw" from the senses and "eliminate from my thought all images of bodily things" (7:34). Such elimination being "hardly possible" (sensory images keep returning), she will consider those images as "empty and worthless." She repeats the finding that "I am a thing that thinks" and reprises the kinds of thinking she experiences (7:34–35). Having listed "everything that I truly know" (7:35) – or has "noticed" she knows – she searches for other knowledge, possibly overlooked. Her first finding is a method for acquiring further knowledge.

EXTRACTION OF TRUTH RULE, CLEAR AND DISTINCT PERCEPTION (7:35)

The meditator asks whether the *cogito* result might already reveal "what would be required for my being certain about anything." Perhaps it holds the key to other certain knowledge. In probing the implications of being "certain that I am a thinking thing," she arrives at a rule or method for discovering truth. This oft-neglected passage is important, for if Descartes can extract a method for achieving certain knowledge by scrutinizing the *cogito*, then that first result would truly be his Archimedean point. By showing how to acquire other truths, it might lead to "firm" and "lasting" knowledge in the sciences as foreseen early in the First Meditation.

We should, therefore, examine this passage carefully:

> I am certain that I am a thinking thing. Do I not therefore also know what would be required for my being certain about anything? In this primary cognition there is simply a clear and distinct perception of what I am asserting; this would not be enough to make me certain of the truth of the matter if it could ever turn out that something which I perceived with such clarity and distinctness was false. So I now seem to be able to lay it down as a general rule that whatever I perceive very clearly and distinctly is true.
>
> (7:35*)

The meditator restates a piece of knowledge and asks how it is known. She is seeking the cognitive means by which the result was achieved, which she takes to exemplify a rule for gaining truth in general. The proposed rule, "that whatever I perceive very clearly and distinctly is true," guides the subsequent search for metaphysical first principles. But here the meditator merely concludes that it "seems" that she can lay down this rule. We need therefore to evaluate the argument and (in the next section) to consider why she pauses.

This *extraction argument* can be summarized in three premises. This summary assumes that in touting the "certainty" of the *cogito* conclusion, Descartes implied that it is known to be true:

(1) I know with certainty that I am a thinking thing.
(2) This knowledge is achieved only by means of clear and distinct perception.
(3) Clear and distinct perception would not be sufficient to yield such knowledge if it were in any way fallible.
(4) Therefore, clear and distinct perception provides a sufficient ground for knowledge; whatever I so perceive is true.

Some of the premises are more straightforward than others. The meditator having accepted the *cogito* reasoning, premise (1) is already allowed. Premise (3) represents the standard of infallible knowledge as established in the First Meditation and so is not problematic in this context. One might wonder whether the general reliability of clear and distinct perception as a method of

knowing could be established by considering only a single instance of knowledge, as reported in (1) and described in (2). There is nothing wrong with this procedure, as long as the paradigmatic instance in premise (1) really is acquired solely through the method indicated in (2). Premise (2) does the real work and so requires closer scrutiny.

Premise (2) addresses the cognitive means for establishing the claim reported in (1). It does not concern the premises supporting the conclusion "I am a thinking thing" – such as "I am having such and such thought" – but the method by which they were known to be true and to establish the conclusion. The method allegedly is "clear and distinct perception." Premise (2) asserts that the *cogito* result relies only on clear and distinct perception. The meditator can evaluate this claim by isolating those aspects of the *cogito* reasoning that establish its certainty and discovering whether they come down to clear and distinct perception.

The argument is logically valid. For it to be sound, (2) must report the actual means used by the meditator to establish the extended *cogito*. If the meditator is deceived about the *cogito* reasoning, and it does not depend on clear and distinct perception, or it does not depend on that alone, then the argument is unsound (because this premise is false). But if (2) accurately reports the method that establishes the truth of (1), then, given premise (3), the conclusion (4) has been established.

The conclusion of the argument is that clear and distinct perception yields truth. Yet the quotation above says only that the *cogito* conclusion is certain. Is there a distinction between certainty and truth? Ordinarily there is. We can be certain of something (say, that our friend will win the chess tournament) and yet be wrong. Certainty of belief ordinarily is consistent with the belief's falsehood. In interpreting Descartes, however, we will assume that he used the term "certainty" to mean "certain knowledge of the truth," so that his writings do not support a terminological distinction between truth and mere certainty. (He must still show that his methods yield certain knowledge of the truth, not merely certainty in the ordinary sense.)

Even granting that the argument establishes a method for finding truth, a problem remains. How do we recognize when our perceptions

are clear and distinct? Presumably, we are all convinced by the *cogito*. But do we find a quality of mind attending this conviction that can serve as a sign of truth in other cases? Gassendi raised this question (7:318), as have others since. If we can't recognize clear and distinct perceptions and distinguish them from those that are not clear and distinct, the proposed truth rule is useless.

Descartes offers no definition of clear and distinct perception in the six Meditations. One might expect to find a definition in the Geometrical Arguments (Second Replies), which seek to demonstrate the main metaphysical conclusions of the *Meditations* directly and briefly. However, in that exposition, the phrase "clear and distinct perception" appears relatively late and remains undefined (7:164). But he does provide instructions for noticing things that can (allegedly) be clearly and distinctly perceived. He first directs his readers to shun the senses and reflect on their own mind until they are "in the habit of perceiving the mind clearly" (7:162). He then asks them to consider "self-evident propositions" (Latin *per se notum*) so as to exercise their "intellectual vision" or "perspicuity" (7:162–63*). They should consider ideas of the natures or essences of various things, including God, and reflect on examples of clear and distinct perception, as well as of obscure and confused perception, from various Meditations (7:164). In effect, he relies on his readers to recognize clear and distinct perceptions through examples. (The *Principles* defines "clear" and "distinct" [8A:21–22], although not in a way that avoids appeal to his readers' own abilities to recognize instances.)

The remaining Meditations offer new examples of clear and distinct ideas or perceptions at regular intervals, including (soon) the "maximally clear and distinct" idea of God (7:46). Accordingly, the Geometrical Arguments reprise the procedure of the main work. However, the Fourth Meditation offers a criterion for recognizing clear and distinct perceptions, stemming from their cognitive force toward being affirmed (examined in Ch. 6).

DIALECTIC OF DOUBT (7:35–36)

The meditator immediately considers some reasons for pause concerning the proposed rule of truth. She observes that she

previously accepted many things "as wholly certain and evident" (7:35) that she now doubts. These include all the objects of the senses. She now questions her earlier, habitual belief "that there were certain things outside me that my ideas proceeded from and which they fully resembled" (7:35). This "resemblance thesis" undergoes further scrutiny in the Sixth Meditation, where it is rejected. At present, it is one of the "preconceived opinions" that the meditator had thought she perceived clearly but now (by comparison with the *cogito*) finds that she did not. The fact that she once firmly held such preconceived opinions does not really challenge the new criterion; rather, comparison with the new standard of clarity allows her to reaffirm the doubtful status of her previous beliefs.

The most serious challenge to the truth rule is the unresolved deceiving-God hypothesis. This hypothesis was used in the First Meditation to cast doubt even on the transparent truths of mathematics, such as that $2 + 3 = 5$. Yet those truths, now described as "simple and easy" (7:35), must surely meet the newly proposed standard of clear and distinct perception. The meditator reflects on just this point:

> Did I not at least see these things clearly enough to affirm their truth? Indeed, the only reason for my later having judged that they are open to doubt was that it occurred to me that perhaps some God could have given me a nature such that I was deceived even in matters that seemed most evident. And whenever my preconceived belief in the supreme power of God comes to mind, I cannot but admit that it would be easy for him, if he so willed, to bring it about that I go wrong even in those matters which I think I see utterly clearly with my mind's eye.
>
> (7:36)

This passage sets up an opposition between the "simple," "clear," and "most evident" truths of mathematics and a subsequent judgment that they are "open to doubt." Interestingly, the ground for doubt is described as a "preconceived belief" in an all-powerful God. The passage pits clear perceptions, for which the meditator has new-found appreciation, against grounds for doubt based on mere preconceived opinion.

Descartes now has the meditator engage in a kind of dialectical interplay between doubt and certainty. As previously noted, the truths of mathematics can be doubted "whenever my preconceived belief in the supreme power of God comes to mind." But there is another side:

> Yet when I turn to the things themselves which I think I perceive very clearly, I am so convinced by them that I spontaneously exclaim: let whoever can do so deceive me, he will never bring it about that I am nothing, so long as I continue to think I am something; or make it to be true that I have never existed, since it is now true that I exist; or bring it about that two and three added together are more or less than five; or similar things, in which I perceive a manifest contradiction.
>
> (7:36)

In this passage, the mathematical equation 2 + 3 = 5 is placed on a par with the *cogito* conclusion. Furthermore, the wording suggests that doubt about such truths cannot arise while they are being contemplated directly; it can arise only when one turns to the deceiving-God hypothesis. (Descartes reaffirms this contrast in the Second Replies [7:144–46].) This suggests that the deceiving-God hypothesis can have its effect only when one is not directly considering the clear and distinct perception of some particular truth. Moreover – and this implication is somewhat astonishing – it would seem that when one is considering that hypothesis, it is able to cast aspersion on all clear and distinct perceptions considered in general (and so tacitly including the *cogito* conclusion). Thus the meditator is caught: while thinking of some beliefs, she cannot but affirm their truth. But when considering the deceiving-God hypothesis, she can apparently doubt anything. (However, since this very act of doubting – or indeed any thought at all – provides grounds for reaffirming the *cogito*, a blanket doubt covering the *cogito* conclusion provides grounds for undermining itself, in a way that a blanket doubt covering mathematical truths does not; the *cogito* retains its special status [see 7:145–46].)

Nonetheless, the deceiving-God hypothesis cannot be shaken simply by our staying focused on clear and distinct perceptions.

There are two reasons for this, one practical, one theoretical. As Descartes explains elsewhere, it is impossible to stay focused on a clear and distinct perception all the time, for we are psychologically incapable (7:62; see also 4:116). Second, the meditator is seeking stable truth. As long as the deceiving-God hypothesis remains alive, it represents a standing objection that impugns her clear and distinct perceptions. If her aim is firm and lasting truth, the fact that this objection has no effect on her assent to clear and distinct perceptions while she is having them doesn't suffice. Presumably, she doesn't want merely to be momentarily free from doubt; she wants to remove the doubts once and for all.

Descartes presents the situation in just this manner. In continuing the passage quoted above, he explains why the deceiving-God hypothesis must, if possible, be laid to rest:

> And since I have no occasion to think that there is a deceiving God, and I do not yet even know for sure whether there is a God at all, any reason for doubting that depends simply on this supposition is very slight and, so to speak, metaphysical. But in order to remove even this slight reason for doubting, as soon as the opportunity arises I must examine whether there is a God, and, if there is, whether he could be a deceiver. For if I remain ignorant in this matter, it seems that I can never be fully certain about any other.
>
> (7:36)

Here he presents the deceiving-God hypothesis as "slight" and "metaphysical" and remarks that it at least "seems" to render everything else dubious. (In calling it "metaphysical," he emphasizes its removal from everyday concerns and from an everyday standard of what is *certain enough* – a standard then known as "moral," by contrast with "metaphysical," certainty [see 6:37–38].) Nonetheless, the hypothesis undermines the sort of knowledge the meditator seeks, which must meet the high standard of being immune from doubt – not from willful or arbitrary doubt, but from reasoned doubt. Hence, the reason for doubt provided by the hypothesis, however slight, must be examined thoroughly. That examination occupies the remainder of the Third Meditation.

REVIEW OF SOURCES OF IDEAS (7:36–40)

In preparation for considering the deceiving-God hypothesis, Descartes has the meditator investigate the structure of thought with a focus on ideas and judgments. The aim is to discover which kinds of thought "can properly be said to be the bearers of truth and falsity" (7:37). This investigation is part of a larger inquiry into the truth or falsity of any hypothesis, including the deceiving-God hypothesis. Its basis is restricted to the content and activity of the meditator's own mind, where Descartes must expect her to find adequate grounds for his theory of ideas and their role in thought, and subsequently for proving the existence of God.

IDEAS, VOLITIONS, AND JUDGMENTS

The concept of an idea plays a central role in Descartes' analysis of the structure of thought. The account of ideas in the Third Meditation is intricate and can be better understood by drawing on his other writings, including the Replies and *Principles*. In this Meditation, Descartes again (as with the wax) uses as examples ideas of material objects, even though the existence of such objects remains in doubt.

As previously observed, Descartes used the term "thought" broadly, to mean any state of mind, including perceiving, willing, doubting, fearing, and knowing. He used the term "idea" for the content of a thought, what the thought is about or what it says. In so doing, he adapted a philosophical term that was standardly used in his time to describe forms or ideas in the Divine mind (7:181). Descartes appropriated the term to describe what is "in" a human thought (3:383) or is "perceived" by the human mind (7:181). In his parlance, ideas in the strict sense portray individual things with their properties. Such ideas can be complex, such as the idea that there are men in the square wearing hats and coats and moving about. In a wider and looser sense, one speaks of ideas of common notions, such as that equals added to equals yields equals (8A:9; also, 5:153), which don't describe particular existents but abstract relations. Presumably, simple notions, such

as *existence* or *thought*, which describe properties of things without affirming the existence of any thing (8A:8), are also ideas in this wider sense.

In the Preface, Descartes explained a crucial distinction between "idea" taken "materially," as an "operation" or state of mind, and taken "objectively," as "the thing represented through this operation" (7:8). He invokes the same distinction in the Third Meditation, using somewhat different terminology. He distinguishes between ideas taken "formally," simply as modes of thought, and "objectively," according to which "one represents one thing, another another" (7:40–41). (Both sets of terms were adapted from scholastic philosophy.) This crucial distinction needs thorough exploration. It allows us to talk about ideas in two ways, and also to talk about their relation to the objects that they represent. We can talk about ideas as modifications of the mind (their formal reality), without considering their content. We can talk about ideas as representations (that is, taken "objectively), which are "of" or portray various objects (existent or not). And, in assessing the correspondence of ideas as representations to the things they represent, we can talk about objects that exist apart from ideas and ask whether the idea, as a representation, accurately portrays that object. Let us start, as does Descartes in Meditation 3, by considering ideas as representations.

Descartes begins by saying that ideas, properly speaking, "are as it were the images of things." Examples include the thought of "a human being, or a chimera, or the sky, or an angel, or God" (7:37). The meditator has the example of people in the street fresh in her mind (from Med. 2). The *idea* of those people would have as its content, at the least, the visual experience of certain shapes and colors moving in a certain way. To say that ideas are "as it were the images of things" is (in part) to say that our experiences present to us various individual things, which, in visual experience, are presented as spatially structured and chromatically variegated.

But not all the ideas listed can be literally imagistic, and hence not all ideas are genuine images. Descartes, like his Aristotelian predecessors, held that there can be no sensory images of immaterial beings such as God (7:136–38, 181). By including God

and other immaterial beings (angels) in the list of ideas that are "like images," he implies that even ideas that do not possess spatial structure (hence are not literally imagistic) are still somehow comparable to images. Two points of comparison meet this condition. Ideas, like images, *represent* things (see 7:372–73); and the ideas in the list, like images, represent *individuals*. Ideas represent or portray individuals as having various properties, as an image of a man might show him as having a head, two arms, and two legs, as sitting or standing, etc. The idea of God, although not literally imagistic, nonetheless represents him as having various properties (as we will soon see).

We can better understand Descartes' distinction between ideas taken formally and taken objectively by comparing ideas to paintings. Their formal reality is like the reality of canvas and paint. Assume that we have many identical canvases, on which various individuals have been portrayed using the same collection of paints. The paintings are alike in their constituents (canvas and pigments), but they differ in what they portray or represent: one is of people in the street, another presents a chimera (a mythical beast having a lion's head, goat's body, and serpent's tail). What each painting portrays is its "object." Here, "object" means the subject matter of the painting. Descartes invokes this sense of the word in speaking of ideas "taken objectively" or in terms of what they "represent." (We should note that ideas, taken formally, are considered as modes of the thinking thing, which has not been assigned any bodily properties; in that respect, ideas are not really like canvas and paint. But the analogy is helpful in conveying that ideas, taken formally, are ascribed existence without attending to their content as ideas.)

The painting analogy helps with a further point. A painting (or idea) can exist even if the object is fictional, as with a chimera. Hence, we need to distinguish three things with respect to an idea: its existence as a state of mind, its representational content, and the individual thing that would exist if the content portrayed an existing thing. The content of the painting determines what it is of – although how this works is a matter of controversy. For our purposes, we can assume that just as we can tell when a painting or photograph is a good likeness of an individual, and so

can recognize it as "of" that individual, so too we can establish what object an idea represents by considering what it portrays (what its content is). If the painting (idea) prominently contains a horse shape, it is of a horse (objectively). If the horse is recognizable as the famous Triple Crown winner Secretariat, it is of that individual. But the painting need not be of an existing horse, in which case it still represents (portrays) a horse without there being a matching horse in the world. (This discussion raises the question, to which we return in Chs. 8 and 10, of how, if we are aware only of our own thoughts – as the meditator now supposes – we could ever "check" the match between our ideas and the individuals in the world.)

In the Third Meditation, Descartes turns next to the relation between ideas and other acts of thought, in order to ask which combinations of ideas and acts can be evaluated for truth and falsity and which not. The meditator finds that some thoughts "have certain other forms" besides their content: "thus, when I will, or am afraid, or affirm, or deny, I always in fact apprehend some particular thing as the object of my thought, but my thought also includes something more than the likeness of that thing" (7:37). Some thoughts, in addition to including an idea that portrays an object (say, a lion), possess another factor (say, fear of the lion). These added factors include volitions, emotions, and judgments. Emotions attach a feeling to the idea, whereas volitions and judgments are actions the mind takes toward an idea. For example, if one desires an apple (an emotion), the feeling of desire (the added "form") is felt along with the idea of an apple; the idea determines the content or object of the desire. Deciding to eat the apple is a volition or act of will. The objects of desires and volitions need not exist. One may desire to eat an apple from the cupboard, though none are left. In that case, an apple as represented in the idea is the object of the desire. To affirm (or deny) that the apple exists would be an act of judgment.

The meditator now sorts through some ideas and their pairings with added factors. Although initially she asked which thoughts can be true or false, she now focuses on which can yield falsity (7:37). Interpreters disagree on the significance of this shift – whether it is meaningless or reveals something important about

Descartes' theory of ideas. If the latter, it would mean that of the various combinations the meditator sifts through, some can be true but cannot be false. (By contrast, many interpreters think that Descartes must hold that any type of thought that can be true must also be capable of falsity.) Let us follow the meditator's search with this in mind.

The meditator does not classify cases of desiring the non-existent as possibly false. As she explains, "even if the things which I may desire are wicked or even non-existent, that does not make it any less true that I desire them." Similarly, the idea of a chimera does not create a false cognition: "whether it is a she-goat or a chimera that I imagine, it is no less true that I am imagining one rather than the other." The combination of desire and idea, or the bare idea itself (even of a chimera), cannot be false. Concerning the ideas themselves, "if they are considered solely in themselves and I do not refer them to anything else, they cannot strictly speaking be false" (7:37). Desires, emotions, and volitions cannot be false because they do not make a claim that extends to something else. Of the various added factors, only judgments can be false (7:37, 43); they take the content of the idea as referring to something else. That is, in paradigmatic instances of judgment, using ideas from our list above, the judgment affirms (or denies) that the content of the idea describes a particular existing individual. The episode of my desiring the apple (when none are there) yields falsity only if I also *judge* that the apple is there – which I might normally do in going to the cupboard, but which remains a separate act from desiring.

So far so good. But aren't ideas mental states with objective reality, a content that portrays things as being a certain way, which we may contemplate without making a judgment? If we don't judge, do we then consider our ideas without their content? In that case, the idea of a chimera would be like a painting that is taken for a mere pattern of colors and not as representing any subject matter. As an interpretation of Descartes' theory of ideas, this is implausible. For Descartes soon explains that all ideas (in the strict sense) are "as it were of things" (7:44). Indeed, we always understand the objects of our ideas "as if they were existing things" (7:117), even if they are fictions (7:119), such as the

chimera (but compare 7:383). It appears, then, that the idea of a chimera is intrinsically contentful: it is *as of* an existing beast. Moreover, it seems this content may be true or false, inasmuch as it portrays the beast as existing. And yet the bare idea is not "strictly speaking" false. What is needed for a thought to be guilty of falsehood?

The answer depends on the attitude we take toward the chimera as portrayed in our idea. The act of thought can be false only if we actually make a judgment about the chimera's existence. Paradigmatic judgments *take a stand* on whether the content of an idea corresponds to an existing thing. In judging, we either grant that what the idea represents is the case (affirmation) or assert that it is not the case (denial). Suppose our idea is that there is an apple on the table. The act of judging simply affirms or denies its content – content that the idea has prior to the judgment. If we affirm the apple's existence, and it is there, the judgment is true; if it is not there, the judgment is false. The opposite judgment denies that there is an apple on the table and is false if one is there. (The topic of ideas and truth or falsity recurs below and in Chs. 6–7.)

JUDGMENTS AND IDEAS AS IMAGES

The *Meditations* is intended to show the way to true judgments, so it is reasonable for us to dwell a moment on the theory of the content of judgments. A problem arises if we suppose that (in some cases, at least) genuinely imagistic ideas are supposed to provide, by themselves, the content for a judgment. We often think of judgments as expressed through a sentence, as in "there is an apple on the table." Such sentences are in some ways more abstract than imagistic ideas, but in other ways may be more specific. A visual image of an apple on a table ordinarily shows the apple as red, yellow, or green, the table as covered by a cloth or not, the cloth as checkered or not, and so on. The image includes more information than is found in the sentence (the sentence "abstracts" from these details). Furthermore, faced with a bare image, say an image of a boy that exhibits various details about

him (he is in the yard, has black hair, etc.), and instructed to affirm "what the image represents," we are hard pressed to know exactly what to assert. Do we simply say "this is how things are," mentally pointing to the whole image and so asserting that the boy is in the yard, wearing these clothes, running toward the rear, etc.? What if the boy is our cousin? Does the image represent that? It would seem not (in any explicit manner). Yet we can certainly judge that the boy in the yard is our cousin – an ability that would be hard to explain if the content of judgments were restricted to bare images.

However, Descartes did not believe that he could or should reduce the content of judgments to pictures or images. Far from it. As mentioned, not all ideas are genuine images – the idea of God is not. Furthermore, as in perceiving the cloaked persons (Med. 2), some ideas act as concepts of things, which serve in the recognition of a thing as being of a specific kind, such as a human being. (These are "ideas" in the wide sense mentioned above, which certainly can contribute to a thought's content.) Such concepts enter into judgments that classify things into kinds. Moreover, ideas can be complex, containing simpler ideas as components. Presumably, non-imagistic ideas can be combined in thought with the content of imagistic ideas. And within imagistic ideas, Descartes allowed a role for attention. When contemplating an imagistic idea, say of a particular shape, we can focus on particular aspects of it (7:72).

These various points come together in the example of our cousin in the backyard. From seeing the boy in the yard and knowing he is our cousin we might judge that our cousin has black hair. The non-imagistic idea of *cousinhood* would be added to the visual image we have of the boy; we would attend to the hair (presumably also invoking conceptual ideas of *hair* and *black*) and affirm the resulting complex idea, that our cousin has black hair.

Descartes did not work out in further detail a theory of how ideas combine to yield the content of judgments. Still, the discussion thus far should meet our interpretive needs, as we consider his further statements about judgments and ideas below and in Meditations 4 and 5.

SOURCES FOR IDEAS

The meditator now finds that ideas seem to fall into three categories, according to their source. Some are "innate," some "adventitious," and some "invented" (7:38). Innate ideas include "my understanding of what a thing is, what truth is, and what thought is." Here Descartes affirms what we found to be presupposed in the *cogito* reasoning, namely, that the mind is innately stocked with a variety of ideas. Adventitious ideas are those that arise unbidden, which the meditator hitherto ascribed to external causes; examples include hearing a noise or feeling the warmth of a fire. Invented ideas are like those of a "siren" (a mythical sea nymph) or a "hippogryph" (a mythical monster with the head and wings of an eagle and the body of a horse), which we form by combining ideas we already have.

Although the meditator accepts this tripartite division as merely provisional, in the end Descartes holds to the division, which he elaborates further (to include, for instance, ideas called forth in imagination, which are not adventitious and need not be invented [7:72; also, 11:343–48]). To Hobbes, Descartes explains that "when we say that some idea is innate in us, we do not mean that it is always there before us" (7:189). Rather, to say that we have an innate idea is to say that the power of "summoning up" the idea is found within us, in the structure of our intellect. This sort of ability to call forth an idea is different from the bare ability to have sensory ideas, which also can be considered an innate capacity (8B:357–59). That is, in Descartes' ultimate thinking about ideas, he grants that sensory ideas arise in us because the mind has a capacity to be affected by the body, in ways that are discussed in Meditation 6.

EXTERNAL OBJECTS AND THE RESEMBLANCE THESIS

The meditator continues by examining more generally the contents of her ideas, beginning with "adventitious" sensory ideas and her earlier reasons (as an Aristotelian or an untutored person of good sense) for believing that they "resemble" external objects (7:38). The resemblance thesis earlier was recalled as asserting

"that there were certain things outside me that my ideas proceeded from and which they fully resembled" (7:35). That is, external objects cause our sensory ideas, which exhibit those objects as they are. The meditator had thought she perceived this "clearly" but now accepts that she did not. She examines three reasons for her earlier belief: that nature "taught me to think this"; that sensory ideas come unbidden and so "do not depend on my will"; and that it is obvious that "the thing in question transmits to me its own likeness rather than something else" (7:38). She finds that they do not establish the resemblance thesis.

The first reason, that nature teaches the belief, means "a spontaneous impulse leads me to believe it" (7:38). We experience objects as having various properties, including color. We "naturally" believe that the objects are colored in a specific sense: that the color in them "resembles" our experience of it. What you see is exactly what is there (as opposed to some other theory of object color, e.g., that it is a physical microstructure that affects the light it reflects). In Meditation 6, the meditator recalls that, when she formed the resemblance thesis, her beliefs about external objects derived exclusively from her sensory ideas, so that "nothing could occur to me except that the things resembled the ideas" (7:75). She naïvely assumed that her sensory ideas present the qualities of objects just as they are. This "natural impulse" is laid aside upon recalling that such impulses previously led her astray, so that she has no reason to trust them now (7:39). (A misleading natural impulse is the desire to drink when ill with dropsy [7:143].)

The second reason assigns an external cause for sensory ideas because they come to mind unbidden. The meditator now considers that, although these ideas are not subject to her will, they might stem from an unknown faculty in her rather than an external cause. Unbidden ideas arise in dreams "without any help from external things" (7:39). The class of sensory ideas might arise from within, so the occurrence of such ideas does not demonstrate the existence of something beyond her own mind.

As to the "obvious judgment" that the contents of our ideas fully resemble external objects, the meditator asserts: "even if these ideas did come from things other than myself, it does not

follow that they must resemble those things" (7:39). In support, she considers two ideas of the Sun. Our sensory idea makes the Sun appear small in the sky. The other idea derives from astronomical reasoning and represents the Sun as much larger than the Earth. She concludes: "Obviously, both these ideas cannot resemble the same sun existing outside me; and reason persuades me that the idea that seems to have emanated most directly from the sun is highly dissimilar to it" (7:39*). Even if our sensory ideas are caused by external objects, those ideas may not directly reveal the objects' true properties.

NATURAL LIGHT (7:38–39)

In discussing the resemblance thesis, Descartes distinguishes belief that arises from a "spontaneous impulse" from what is revealed "by some natural light." He explains:

> There is a big difference here: for whatever is revealed to me by the natural light – for example, that from the fact that I am doubting it follows that I exist, and the like – cannot in any way be open to doubt, because there can be no other faculty that I could trust as much as this light and that could teach me that such things are not true.
>
> (7:38–39)

In the seventeenth century, the "natural light" contrasted with the light of grace, or supernatural illumination directly from God (7:148). The natural light is the natural or intrinsic cognitive power found in all human minds. This passage, parenthetically inserted into the discussion of natural impulses, makes two important claims about this light. First, it ascribes the *cogito* conclusion to the natural light. Second, it asserts that this light cannot "in any way" be doubted. Does this mean that appeal to the natural light by itself dissolves any remaining doubt, without any need to defeat the deceiving-God hypothesis?

If we assume that the meditator is seeking firm and lasting knowledge, then the deceiving-God hypothesis must actually be defeated; it is not enough simply to remark that the natural light cannot be doubted. That same quality has just earlier been

asserted about clear and distinct perceptions (while we are having them).

The passage introduces the "natural light" as a trustworthy source of knowledge that might serve the meditator's ongoing investigations, and indeed she invokes this light frequently in the coming pages (7:40, 42, 44, 47, 49, 52). Descartes does not directly specify how the natural light relates to the proposed truth rule, that clear and distinct (intellectual) perceptions are true. The passage says that the *cogito* reasoning is seen by the natural light. Earlier, that reasoning was ascribed to clear and distinct perception. It appears that these two means of knowing must at least overlap.

One possibility is that Descartes equates the "natural light" with that subset of clear and distinct perceptions described in the Second Replies as "so transparently clear, and at the same time so simple, that we cannot ever think of them without believing them to be true" (7:145). This would include the *cogito* reasoning, which he there says cannot be doubted, because in doubting it we would think of it and spontaneously perceive its truth (7:146). Or the natural light might even be restricted to the "self-evident propositions" affirmed in the Geometrical Arguments, such as that nothingness cannot be an efficient cause (7:162–63), and also including that whatever thinks, exists, as well as the propositions, presented as axioms, that restate the metaphysical principles used in this Meditation's proofs of God's existence (7:164–65). As we will soon see, it can be asked whether all these propositions are transparently clear and simple. Perhaps foreseeing this question, in a nearby passage Descartes explains that individuals vary in what they find self-evident and suggests that, through concentrated contemplation, metaphysical truths can become as self-evident as the fact that "the number two is even or that three is odd" (7:164). We should recall this claim as these metaphysical principles arise in this Meditation.

In any case, the above passage puts something new into the mix, for it says that the natural light "cannot in any way be open to doubt," and this because "there can be no other faculty that I could trust as much as this light and that could teach me that such things are not true" (7:38–39). This wording takes us

beyond the indubitability of clear and distinct perceptions when we have them; it suggests that the fact that the natural light is all we have somehow makes it unimpeachable as a source of truth. We return to this suggestion below.

The meditator continues preparations for evaluating the deceiving-God hypothesis, sifting through her ideas to find any that require something to exist beyond her own thoughts, allowing her to break out of her own thought world. This search takes her further into the metaphysics of ideas and their causal origin.

DEGREES OF REALITY IN IDEAS (OBJECTIVE AND FORMAL BEING) (7:40)

Descartes has the meditator consider her ideas from the two perspectives we met with above: first, simply as individual states of her own mind, without paying attention to their content; and, second, as states of her mind that represent (or seem to represent) things to her. He then presents the further notion that each aspect of an idea has its own kind of reality or being, which comes in degrees. The meditator accepts as uncontroversial that her own ideas, considered without regard to their content, have reality: they exist plain and simple, which means that they have "formal being" or "formal reality." Taken simply as states of mind, they seem equivalent in degree of reality. But they differ among themselves in what they represent. Some ideas seem to present her with horses, having a particular size, shape, and color, others with human beings, God, or angels. This representing content has "objective reality," which, she soon finds, varies in degree.

Since her present aim is to determine whether anything, including God, exists outside her (7:40), she asks whether any of her ideas have a content that could not exist unless produced by the thing represented through that content. In other words, do horses have to exist for me to have the idea of a horse? Does God have to exist for me to have an idea of God? Or could I make up or produce such ideas myself? Would some ideas be more difficult to produce than others? These questions occur to the meditator as she reflects on her own ideas:

> Insofar as the ideas are simply modes of thought, there is no recognizable inequality among them: they all appear to come from within me in the same fashion. But insofar as one represents one thing, another another, it is clear that they differ widely. Undoubtedly, the ideas that represent substances to me amount to something more and, as I would say, contain within themselves more objective reality than those that merely represent modes or accidents. Again, the idea that gives me my understanding of a supreme God, eternal, infinite, omniscient, omnipotent, and creator of all things that exist apart from him, assuredly has more objective reality in it than the ideas that represent finite substances.
>
> (7:40)

This quotation may or may not make defensible distinctions among the degrees of reality found in the contents of ideas – we examine that in a moment. First, we need to penetrate the technical language that Descartes has put in the mouth of the meditator. The technical notions of substance and mode first appear here in the six Meditations (but see 7:13), without much explanation. A few pages hence (7:44), almost as an aside, Descartes glosses a substance as something "suited to exist through itself" (save for divine preservation, introduced below). Examples include a stone, a horse, or a thinking thing. The Geometrical Arguments teach that all properties reside in substances, as their subject (7:161). The term "mode," found in the above passage and environs, is otherwise used sparingly in the *Meditations* (e.g., 7:78, 165), without explicit differentiation from related terms, including "property," "attribute," and "accident" (7:161, 176) – terms that are distinguished and defined in the *Principles* (8A:25–28). For our purposes, we can consider a mode to be a *modification* of a substance (the shape or size of the horse, a thought or idea in a mind).

The above passage introduces the notion of objective reality. In adapting the terms "objective" and "formal" from scholastic authors, Descartes accepted that formal reality is what something has simply in virtue of existing (7:41, 161). To repeat, all the ideas in a mind have formal reality, as states or modes of mind, like the reality of the canvas and paint in our analogy. "Objective reality" denotes a kind of reality that pertains to the

representational content of ideas. In our analogy, such reality concerns the organization of the pigments that makes one canvas into a painting of a horse and another a painting of a chimera. In the mind, the objective reality of an idea of a horse comes down to what it is in the idea that makes it be an idea of a horse instead of an idea of a chimera. Descartes is not very clear on what this factor is, but he expects us to agree that ideas do have contents and that, even though the contents need exist only in the mind, they really do exist there and so have a type of reality.

Now we can look further into degrees of reality, or degrees of being. All human ideas, as states of a finite mind, have the same degree of formal reality; the idea of a shape, the idea of a finite substance such as a horse, and the idea of an infinite being (God) have equivalent formal reality. But they differ in degree of objective reality according to whether the object represented has more or less formal reality. Descartes appeals to a three-level hierarchy of reality or being that depends on his substance–mode ontology. According to the hierarchy, a mode has less formal reality than a finite substance (modes, as modifications of substance, depend on substances for their existence), and a finite substance has less formal reality than an infinite substance. Consequently, the idea of a mode, such as an idea of shape, has less objective reality (less reality in its represented content) than an idea of a finite substance, and the idea of a finite substance has less objective reality than the idea of an infinite one.

The metaphysics of degrees of objective reality is a heady result for the meditator to gain from contemplating her own ideas. Still, the metaphysics is thus far only applied to ideas and their contents; it does not presuppose that there is an infinite substance, or any finite thing or substance other than the meditator herself, with her thoughts. We can better examine the claim about degrees of objective reality in connection with another metaphysical thesis, concerning causes and effects.

CAUSAL PRINCIPLE (7:40–42)

The meditator now considers a causal principle, allegedly revealed by the natural light: "It is manifest by the natural light that there

must be at least as much in the efficient and total cause as in the effect of that cause" (7:40). The term "efficient cause" means what actually produces an effect. A "total cause" must include everything needed to produce its effect. The causal principle here enunciated says that the degree of being, or reality, of the cause must be equal to or greater than the degree of being of the effect. In a rough sense, this says that you can't get something from nothing. In terms of the notion of a hierarchy of being, something with lesser being cannot cause something with greater being.

While we might have questions about its application in particular cases, the principle that you can't get something from nothing does not seem particularly objectionable (as metaphysical principles go). Descartes took it as axiomatic that: "There is no existing thing of which we cannot ask what is the cause of its existence" (7:164), and we may extend this principle to the properties of the thing and any changes in the thing. Such a principle was widely accepted by philosophers. None of the objectors challenged the general principle; one challenged the hierarchy principle (7:123) and two others its application to objective reality (7:92–94, 288–89). (The eighteenth-century Scottish philosopher David Hume prominently challenged the principle that every event must have a cause.)

Descartes applies the causal principle not only to the formal reality of ideas but also to their objective reality:

> In order for a given idea to contain this or that objective reality rather than another, it must surely derive it from some cause that contains at least as much formal reality as there is objective reality in the idea. For if we suppose that something is found in an idea that was not in its cause, it then has this from nothing; and yet however imperfect may be the mode of being by which a thing exists objectively in the intellect by way of idea, still, it is plainly not nothing and so cannot come from nothing.
>
> (7:41)

For a "thing" to exist in the intellect is, in Descartes' terms, simply for us to have an idea with that thing as its content. He is saying here that the content of the idea requires a cause equal to

the degree of being of the thing represented. The content needs a cause, which may be independent of the cause of the formal reality of the idea (as simply a state of mind).

In our painting analogy, Descartes would be saying that the cause of the organization of the paint must possess a degree of reality equal to the intricacy of the image. Presumably, it is easier to make a painting that has only one color than it is to make one that represents (looks like) a many-colored mountainside. In the First Replies, he explains that if an idea portrays a very intricate machine, there must be a cause equal to that intricacy – for example, a degree of intellectual skill greater than that required to have an idea of a simpler device (7:103–4). Similarly, a drawing of an intricate device, say, the plan for a digital computer, would require a more powerful cause than the plan for a simple light switch. (Descartes seems to rule out that random scribbles could produce either plan.) From the notion that the content of an idea requires a cause equal to its intricacy, Descartes constructed a proof for the existence of God.

FIRST PROOF OF GOD'S EXISTENCE, FROM THE IDEA OF GOD (7:42–47)

The meditator's idea of God is the basis for Descartes' first proof from effects. The proof claims that the content of this idea could exist only if God produced it himself. Here is the strategy:

> If the objective reality of any of my ideas is so great that I am certain that the same reality does not exist in me either formally or eminently, and hence that I myself cannot be the cause of this idea, it follows necessarily that I am not alone in the world, but that some other thing also exists which is the cause of this idea. But if no such idea is to be found in me, I plainly will have no argument that renders it certain that something exists apart from me.
>
> (7:42)

For a "reality" to exist "eminently" in the meditator is for her to be able to produce that reality even though she does not formally or actually possess it herself. For example, if God existed he

would be able to create matter, even though he is not material; the reality of matter would be in God eminently, but not formally. The meditator combs through her ideas for one possessing a degree of objective reality that she does not possess formally or eminently. She ranges the ideas in classes: ideas of corporeal inanimate things (and their modes); her idea of herself; ideas of animals and other human beings; of angels; and of God.

The meditator proposes that, even though she now considers herself only to be a mind, she could form ideas of corporeal things from her idea of herself. She thinks of both mind (considered now as a thing that thinks and is not extended) and body (considered as an extended, non-thinking thing) as finite substances (7:44–45). Finite substances are on par; hence, the idea of a body has no more objective reality than that of a mind. Accordingly, she should be able to produce it herself.

In the course of this argument, the meditator distinguishes properties in bodies that she perceives "clearly and distinctly," such as size, shape, position, substance, duration, and number, from those that she thinks of "in a very obscure and confused way" (7:43). The latter include colors, sounds, smells, tastes, and heat and cold along with other tactile qualities. This difference is experientially present to her: it just seems that ideas in the second group are obscure and confused. In explicating this (putative) fact, Descartes introduces the notion of *material falsity* (7:43). This is a complicated notion, which provoked a lengthy exchange with Arnauld (7:206–7, 231–35). For present purposes, the take-home message from this passage (7:43–44) is as follows. Ideas, as ideas, cannot be false "in the strict sense," for such falsity pertains only to judgments (as discussed above); but ideas can offer material for error if their obscurity allows or invites us to misinterpret them and leap into false judgments. Descartes describes two ways in which ideas of sensory qualities might do this. Either the ideas misrepresent the sensory qualities, representing them as things when they are non-things, as, for example, the idea of cold might do if cold is really a kind of non-being (the privation of heat) but our sensory ideas present it as something positive. Or the ideas of sensory qualities do represent actual properties in things but represent them so obscurely that we can't tell what the properties

are (7:44). In the latter case, Descartes says the idea is in a minimal way "true," again suggesting that *ideas* can in some way be true, even if only judgments are, strictly speaking, capable of falsity. (We return to true ideas in Ch. 7 and to material falsity in Ch. 9.) In either case, as also with the better known properties (size and the rest), the meditator finds she would be able to produce whatever objective reality the ideas possess.

The claim that the meditator could produce the objective reality in her ideas of bodies and their properties from herself, although consistent with the causal principle, is unsatisfying. If there really were no bodies, where would she (in today's vernacular) "get the idea" of shape, size, and the rest? At this point, she has no answer. All the same, she needs only to establish that the idea of body is not a clear case in which an external cause would have to produce it. Since, at worst, she is merely unsure whether she could produce it, she can move on.

The ideas of other human beings and angels are again of finite substances and so could be modeled on the meditator's awareness of herself (or, if an angel is a higher finite substance, that idea might depend on her idea of God). But the idea of God, she finds, requires an infinite cause. Because this idea represents an infinite being, it has infinite objective reality. Being finite, the meditator does not possess that sort of reality formally or eminently. Hence, this idea offers evidence of something existing outside her. She need not be concerned that the idea is materially false and fools her; for "since it is maximally clear and distinct and contains more objective reality than any other idea, there is no idea that is truer in itself and in which less suspicion of falsity would be found." The idea requires God as a cause because of its infinite objective reality, which represents God as a "supremely perfect and infinite being" (7:46). Its content represents an external being, and in representing it, proves that being's existence (or so the argument goes).

Descartes' argument requires that the meditator find within herself the idea of God, or of "a substance that is infinite, independent, supremely intelligent, supremely powerful, and which created both myself and everything else (if there be anything else) that exists" (7:45). A recalcitrant meditator might challenge

this requirement in two ways. First, she might claim that she does not possess such an idea. Second, granting she has the idea, she might ask whether it really requires an infinite cause; perhaps the idea of an infinite substance could be constructed from that of a finite substance simply by thinking away its limits (7:186).

Descartes addresses both challenges by having the meditator consider the relation between the finite and the infinite. She now affirms that "my perception of the infinite, that is God, is in some way prior to my perception of the finite, that is myself" (7:45). Her very conception of the finite presupposes a positive idea of the infinite, for her idea of the finite arises from introducing limits to this infinity (see also 3:427, 5:355–56). Compare this case with finite and infinite spatial extents. Consider a shaped area with a determinate boundary. To think away the boundary is to remove it in thought. And yet, one might argue, the very presence of the boundary can only serve to divide the finite area from a surrounding area. No matter how large the bounded shape, it still presupposes a surrounding area. Generalizing, infinite or unlimited being is implicated in the thought of finite being, which arises from introducing limits into this prior notion.

Our two challenges have not been fully met. Even assuming that the idea of the finite presupposes the infinite, must it presuppose the idea of God (i.e., of something supremely intelligent, supremely powerful, and the creator of everything else)? Wouldn't the idea of any infinite being do as a backdrop to the idea of a finite being? If a finite mind can serve as the model for the idea of a finite body, perhaps the idea of an infinite body can provide the model for the idea of God.

Descartes' answer invokes a special unity among the attributes of a truly infinite being (a notion prevalent in the theology of his time). He glosses the idea of God as the idea of a supremely *perfect* being (7:46). In the philosophical terminology of the time, perfection implied completeness of reality or being (see 7:165). Perhaps any truly infinite being would contain all perfections, and so would of necessity be God. This proposal is developed in the second proof.

SECOND PROOF, FROM PRESERVATION (7:47–51)

At end of the first proof, noting the gradual increase in her knowledge, the meditator asks whether she herself might not contain, at least potentially, all the perfections of God. In that case, she would (unwittingly) be the infinite cause of her idea of God. But Descartes has her consider that the idea of God is not of a being who might develop toward infinite perfection, but of an eternal, supreme being. God does not grow and develop. The fact that the meditator experiences ignorance and growth of knowledge in herself already shows that she is not like God (7:46–47).

The meditator now considers "whether I myself, who have this idea [of God], could exist if no such [perfect] being existed" (7:48). This question leads to the second proof, that an infinite creative power is required to explain the existence of any finite being.

The proof proceeds by a process of elimination. Descartes divides the possible causes of the meditator's existence into four: herself; her parents; other beings less perfect than God; or God. He successively rules out the first three, leaving only God. The meditator could not have caused her own existence, for if she could create herself from nothing she would be God – assuming that it takes an infinite power to create something where nothing existed before. Having the power of creation, she would not deny herself other (easier to create) attributes, such as infinite knowledge, and so she would know that she was God (7:48).

The thought that anything capable of creating something would be God plays a central role in the remaining cases. But first Descartes adds a new wrinkle. He has the meditator consider the hypothesis not that she created herself but that she has existed for all time just as she is now (or as she now considers herself to be: a thinking thing). This possibility is excluded using a metaphysical thesis. Because the lifespan of the meditator (even if infinitely long)

> can be divided into countless parts, each completely independent of the others, it does not follow from the fact that I existed a little while

> ago that I ought to exist now, unless some cause as it were creates me afresh at this moment – that is, conserves me in being.
>
> (7:48–49)

This thesis assumes that time can be divided into instants or moments and then asserts that the existence of a finite substance at one moment does not give it the power to exist subsequently. In other words, the power needed to remain in existence from moment to moment is the same as that needed to create something in the first place. The meditator affirms: "that conservation differs from creation only by a rational distinction is also one of the things that are manifest by the natural light" (7:49).

The point about preservation, combined with the claim that only an infinite being can create, is adequate to rule out the other causes of one's existence. These include one's parents and other beings less perfect than God. Even if (as the meditator has believed) her parents caused her body through procreation, God is still needed to preserve in existence the material substance of her and her parents' bodies. Any contributing cause less powerful than God would still depend on God's infinite power for its being. God's power is left as the only explanation of the continuing existence of all finite beings.

This second proof offers a way to respond to the deceiving-God hypothesis, at least in the version that appeals to defective design. The argument purports to show that the meditator's original and continued existence could only be caused by an infinite (perfect) being, which, as Descartes soon suggests, could not be a deceiver and hence would not create the meditator with a defective mind.

These arguments put a lot of weight on the meditator's ideas of perfection, infinity, and God. So let us turn to Descartes' explanation of the origin of those ideas.

IDEA OF GOD INNATE (7:51–52)

The question that began the second proof asked for the source not only of the meditator's existence but also of her idea of God. The meditator considers the candidate sources listed early in the Meditation: the idea is adventitious (from the senses), is invented, or innate.

She rules out the senses by saying that the idea "has never come to me unexpectedly, as is usual with the ideas of sensible things" (7:51). Sensory ideas of trees, houses, tables, and chairs can arise unbidden. The idea of God, apparently, is one we must induce ourselves to experience – or to experience clearly; for the preconceived belief in God may well have been learned from other people, through the senses.

The first proof argued that only an infinite being could cause the idea of God. That argument does not itself show that an infinite body could not be the cause of, or the model for, the meditator's idea of God. In the Third Replies, Descartes contends that "nothing in God resembles what is found in external, that is, corporeal, things" (7:188), which seems to rule out an infinite body as the model. But, it might be objected, if the universe was infinite, wouldn't it resemble God in that respect? But Descartes considers the infinity found in the idea of God to be a special infinity of power and perfection, sufficiently dissimilar from (perhaps incomparable with) an infinity of extension. (Indeed, in the First Replies, Descartes contends that since the universe is not "limitless in every respect," its unboundedness should be called "indefinite" rather than "infinite" [7:113].) The idea of God exhibits a special unity among its attributes (of infinity, omnipotence, omniscience, and so on); a cause is needed not only for the idea of each attribute but also for the meditator's "understanding" of the unity (7:50). This latter cause (which, by the first proof, must be infinite) must also give the meditator the idea of the other infinitary attributes. Must the being that gives her the idea of a unity of infinitary attributes also possess the unity? According to the argument reviewed above, yes. If an infinite cause – that is, one sufficient to produce the meditator's idea of God and to create the meditator – would give itself all other perfections, then any infinite cause would be God and would thus have that unified set of attributes that Descartes finds in the idea of God. (Assuming that the attributes could be combined in one being.)

The meditator next rules out that the idea of God is invented, arguing that "plainly I am unable either to take away anything from it or to add anything to it" (7:51). Presumably, we are able to tinker with ideas of our own invention, altering them as we

like. But the content of an innate idea is presumed to be fixed, once and for all; hence, this (inalterable) idea is innate. Elsewhere, Descartes explains that innate ideas are not fully preformed in the mind but are latent in "the power of thinking" (8B:358). The power of thinking, or the intellectual faculty, has a fixed structure. This means that we are able to discover new aspects of the intellect's latent content but cannot add or take away elements (7:371). However, the idea of God requires a special provision. Unlike other innate ideas, its content cannot arise from our natural, finite power of thinking (per the first proof); hence, God must specifically enable the intellect to form the idea of an infinitely perfect being. This innate (latent) idea of God is like "the mark of a craftsman stamped on his work" (7:51).

Just as the *cogito* reasoning depended on several innate ideas, Descartes' argument for the existence of God requires innate ideas besides that of God – or perhaps extricated from the idea of God. These include the positive idea of infinity; the ideas of unity, simplicity, perfection, substance, and immateriality; and the ideas required by the causal principle. Such ideas must be innate, because they pertain to things that cannot be represented by the senses or imagination (as with God and his attributes). Or so Descartes argued in contending that the infinity of God could not be modeled on any lesser being.

The existence of innate ideas has been presupposed all along in Descartes' meditational approach. The device of turning away from the senses and imagination won't work if there is no source of cognition independent of the senses and imagination. But Descartes permits no other source for the ideas of metaphysics. This restriction puts a heavy burden on his arguments. Not only must they be well formed logically, they must also convince readers of their soundness by prompting them to find within themselves the required innate ideas, along with metaphysical principles that are manifest to the "natural light." If one follows Descartes' work carefully but cannot find the innate idea of God as described, the arguments are in trouble. Several objectors, including some who shared Descartes' religious belief, denied that they possessed an innate idea of God such as the meditator sought to find within herself (7:96–97, 123–24, 186–87, 307).

GOD IS NO DECEIVER; DIVINE LIGHT (7:52)

Finally, the meditator returns to the deceiving-God hypothesis. From the idea of God as an infinite, perfect being, she concludes that God "is subject to no defects whatsoever." From this, it follows "that he cannot be a deceiver, since it is manifest by the natural light that all fraud and deception depend on some defect." Deception stems from a defect; hence, God's perfection entails that he would not deceive.

The meditator now pauses in contemplation of God, "to gaze upon, wonder at, and adore the beauty of this immense light, so far as the eye of my darkened mind can bear it," thereby experiencing the "greatest joy" of this life. Such contemplation would be part of a spiritual exercise, especially of Augustinian flavor, which invites contemplation of an immaterial God. In Descartes' cognitive exercises, experiencing the light of the intellect in contemplating God solidifies the new-found experience of nonsensory, purely intellectual thought.

If God is no deceiver, then the "slight" and "metaphysical" ground for doubt has been removed. The Fourth Meditation explores the implication of a nondeceiving God for our knowledge. Before turning there, let us examine a problem raised by the first readers of the *Meditations*.

THE CARTESIAN CIRCLE

In the Third Meditation, Descartes appeals to the natural light, or the faculty of clear and distinct perception, to prove the existence and nondeceptiveness of God (7:40–50). The fact that God exists and is no deceiver releases the meditator from the doubt about the reliability of clear and distinct perception (7:35, 52).

This procedure has the appearance of circularity. A particular method of ascertaining the truth (clear and distinct perception) is vindicated by proving that God exists and is no deceiver; but this proof relies on that very method. (Note that a similar problem might arise no matter how Descartes attempted to validate clear and distinct perception; the Cartesian circle is an instance of a

general problem concerning how one could ever know that one's method of knowing was sound.)

The charge of circularity was leveled by Arnauld in the Fourth Objections:

> I have one further worry, namely how the author avoids reasoning in a circle when he says that we are sure that what we clearly and distinctly perceive is true only because God exists. But we can be sure that God exists only because we clearly and distinctly perceive this. Hence, before we can be sure that God exists, we ought to be able to be sure that whatever we perceive clearly and distinctly is true.
>
> (7:214)

The first sentence paraphrases a line from the Fifth Meditation, where the meditator reasons explicitly from having perceived "that God exists," "that everything else depends on him," and "that he is no deceiver" to the conclusion that "everything which I clearly and distinctly perceive is of necessity true" (7:70). And it describes the order of the Third Meditation, in which the trustworthiness of clear and distinct perception was made to depend on the investigation of God's existence. The second sentence effectively equates appeals to the "natural light" in the Third Meditation proofs with appeals to clear and distinct perception. The third sentence points out that invoking clear and distinct perception in proving God's existence has nothing to back it up, if our trust in such perception requires that we have proved God's existence and perfection.

Descartes responded in the Fourth Replies (drawing on the Second):

> I have already given an adequate explanation of this point in my reply to the Second Objections (the third and fourth sections), where I distinguished between what we in fact perceive clearly and what we remember having previously perceived clearly. To begin with, we are sure that God exists because we attend to the arguments that prove this; but subsequently it suffices for us to remember that we perceived something clearly in order to be certain it is true. This

> would not be sufficient if we did not know that God exists and is not a deceiver.
>
> (7:246)

In this reply, he makes it seem as if the reliability of clear and distinct perception was never really in doubt, merely our ability to remain convinced of its reliability when not having such perceptions. Circularity does not arise, because the proof of God's existence (which relies on clear and distinct perception) merely gives the meditator license to trust the remembered results of clear and distinct perceptions when she is not having them – presumably, by removing the "slight" and "metaphysical" doubt of the deceiving-God hypothesis. Accordingly, there was no need to justify clear and distinct perception itself, even as the power that examines the grounds for doubt.

This response does not squarely address the objection. Arnauld directly questioned the grounds for believing that clear and distinct perceptions are true. Hence, the fact that we cannot doubt clear and distinct perceptions while we have them would be irrelevant. His concern is not whether we are psychologically capable of doubt in the face of clear and distinct perceptions but whether such perceptions are in fact true. Whether we can doubt them or not, they might still be false. In that case, we should want a proof of their validity that does not rely on clear and distinct perception – a proof that Arnauld rightly says Descartes has not supplied.

This construal of Arnauld's objection distinguishes mere psychological certainty from truth. Earlier, we supposed that Descartes was not interested in mere psychological certainty and that he treated certainty as equivalent to truth. But, Arnauld might object, even if Descartes believes that certainty yields truth, he must provide a reason for accepting that human certainty (of the right kind: clear and distinct perception) is a sufficient criterion for truth. Accordingly, Descartes' response does not address what drives Arnauld's challenge.

Assessment of the circle depends on what Descartes hoped to achieve in the *Meditations*. In previous chapters, we distinguished the aim of vindicating reason (or now, clear and distinct

intellectual perception) from the more restricted aim of reforming metaphysics. And we distinguished the project of discovering the intellect from that of proving the intellect to be reliable. Depending on which aim we choose and how we read Descartes' arguments, different responses to the charge of circularity arise, and we reach different conclusions about the success of Descartes' project. Differing conclusions also may result depending on whether we ask what Descartes intended to argue, as opposed to what he needed to argue to achieve his results (which is what Arnauld asked, and ultimately what we should ask as well).

Interpretations of Descartes' response to the charge of circularity must take into account various elements, including extraction of the truth rule, appeals to the natural light, and the proofs that God exists and is no deceiver. As a guide for inquiry, let us consider four distinct interpretations.

CERTAINTY, NOT TRUTH

We have been assuming that, in the *Meditations*, Descartes sought not merely to find a metaphysics that his readers would accept but to demonstrate that his metaphysics is true. However, passages in the Second Replies apparently indicate that Descartes was not out to show he had the truth. These passages, read one way, suggest that he merely sought to gain maximal human certainty for his metaphysics. Here is the main passage:

> As soon as we think that we correctly perceive something, we are spontaneously convinced that it is true. Now if this conviction is so firm that we cannot ever have any reason for doubting what we are convinced of, then there is nothing left to ask: we have everything that we could reasonably want. What is it to us that someone may make out that the perception whose truth we are so firmly convinced of appears false to God or an angel, and hence is, absolutely speaking, false? Why should we care about this "absolute falsity," since we neither believe in it nor have even the slightest suspicion of it? For we are in fact supposing a conviction so firm that it cannot in any way be destroyed; hence, this conviction is plainly the same as the most perfect certainty.
>
> (7:144–45)

Firm conviction is equated with "perfect certainty," which is (apparently) distinguished from "absolute" truth or falsity.

Accepting this distinction for now, Descartes' reply to Arnauld can yield the following strategy for avoiding the circle. Suppose that his aim is perfect, or unshakeable, certainty (as distinguished from truth). Clear and distinct perceptions provide such certainty while we are having them. When we are not, the deceiving-God hypothesis undermines that certainty, by raising a general doubt about whether such perceptions are reliable. The proofs for the existence of a nondeceiving God use clear and distinct perceptions. We are utterly convinced by those proofs (which we study until they seem immediately obvious) and so are no longer moved by the deceiving-God hypothesis. We have not shown that clear and distinct perceptions are true and so have not shown that the proofs of God are true. But we have shown that they are maximally certain, thereby reaching our goal of unshakeable belief.

On this reading, Descartes was really seeking to induce in the reader a kind of psychological equanimity regarding his new metaphysics. In this way, he was like those ancient skeptics who sought peace of mind. In contrast to true skepticism, this peace of mind arises from immovably affirming metaphysical principles (rather than suspending judgment). If disturbing doubts arise, the remedy lies ready in the clear and distinct perceptions of the Third Meditation.

The "certainty, not truth" reading offers a way out of the circle by having Descartes abandon his avowed goal of truth (7:69–70, 577–78). Given this cost, we should ask whether the quoted passage really demands a distinction between certainty and truth. Notice Descartes does not say we should not care if our results are "absolutely false." Rather, he asks why we should care about "alleged" absolute falsity, "since we neither believe in it nor have even the slightest suspicion of it" (7:145). A few paragraphs later, he maintains that the clarity of our perceptions "does not allow us to listen to fabrications of that kind" by those who "make out that such truths appear false to God or to an angel" (7:146). Further on, in addressing a query about whether human concepts actually match reality, he suggests that to deny that they do would be to undermine all human knowledge "for no good

reason" (7:151). Perhaps Descartes was indeed after genuine truth but dismissed unsupported warnings of allegedly possible "absolute falsity" as arbitrary and without basis.

Assuming that Descartes was seeking metaphysical truths, the "certainty, not truth" approach neither accords with his intent nor reveals what he would need in order to achieve his goal. A second approach begins from his remark that we have no reason to suspect absolute falsity. He might be invoking the First Meditation point that an arbitrary decision to doubt is not sufficient. This suggests a second strategy for avoiding the circle.

REMOVE THE DOUBT

On the "remove the doubt" strategy, Descartes was not aiming to *prove* that clear and distinct perception is true, only to show that the grounds for doubting such perception do not withstand scrutiny. In saying that the circle can be avoided by carefully distinguishing between having clear and distinct perceptions and merely remembering having them, Descartes was reminding Arnauld that the deceiving-God hypothesis achieves its initial force in relation to remembered, as opposed to directly experienced, instances of reasoning (see also 7:473–74). Prior to full scrutiny of the deceiving-God hypothesis, it appears to offer a "well thought-out" reason for doubting even evident perceptions (7:21). But investigation reveals an internal contradiction: God, who is conceived as perfect, could not be a deceiver. The supposed reason for doubt is removed without using clear and distinct perception to prove that God exists but only to show that deception is incompatible with a supremely powerful being's perfection. Hence, the circle is (allegedly) avoided. Lacking any reason to doubt clear and distinct perception, we achieve certainty, which we take to coincide with truth. (This outcome gains "weak vindication" for reason, in the terminology of Ch. 3.)

The "remove the doubt" strategy fits with what Descartes said in reply to Arnauld. But it has its own problems. Granted, Descartes does not permit arbitrary grounds for doubt. However, once the deceiving-God hypothesis – or the other grounds for doubt, such as defective origins – has been framed, it is questionable that clear

and distinct perception of the idea of God suffices to remove that doubt. The argument excludes the deceiving-God hypothesis as logically flawed for attributing deception to a being who, on careful consideration, is conceived as perfect. The consideration of God need not prove *that* he exists, only that, *if* he exists, he is perfect. But how can we be sure that our idea of God accurately represents the properties he would have and so establishes that deception is incompatible with his perfection?

More generally, we may wonder whether simply finding an internal problem with the deceiving-God hypothesis removes other First Meditation grounds for doubt. Neutralizing the defective-origins hypothesis seems to require proving, by clear and distinct perception, that a God (who is no deceiver) actually exists and created us, as opposed to our having a possibly defective natural origin. The substantive metaphysical principles used to prove that a nondeceiving God exists must be known to be true. The reliability of clear and distinct perception must again be presupposed, and the circle returns.

PRESUMPTION IN FAVOR OF THE INTELLECT

What if Descartes believed that the meditator could reasonably begin with, or adopt at some point, a strong presumption in favor of the human intellect? That is, what if the burden of proof were squarely on the doubter? When paired with this presumption, a "remove the doubt" strategy might suffice. To assess this possibility, we must step back and reflect on Descartes' aims in the *Meditations*.

In Chapter 3, we considered the possibility that the *Meditations* did not aim for a strong validation of reason but for the discovery of pure intellect in order to reform metaphysics. Suppose for now that those are the aims. Descartes' intent then would not be to prove the intellect is reliable but to reveal its force in actual cases of metaphysical reasoning. Now add that he didn't require strong validation because he held that we should trust the best use of our cognitive faculties to yield truth, barring some compelling reason not to trust them. Removing the grounds for doubt then banishes such reasons, and we are left with our presumption.

On this reading, Descartes first brings the meditator to appreciate the existence and force of clear and distinct perception through the *cogito* and extraction argument. The extraction argument is read not as proving the truth of clear and distinct perception but as revealing the method responsible for the *cogito*. Having discovered the pure intellect, or the natural light, as a tool for finding the truth, the meditator proceeds to use this cognitive resource in evaluating the metaphysical basis of the deceiving-God hypothesis. A thorough investigation shows that the grounds for doubt are wanting. Our clear and distinct perceptions tell us that God exists and is no deceiver. Assuming that these arguments are otherwise valid, we would simply be left to assess their soundness by asking whether the "natural light" actually extends to the causal principle, and whether we actually find the needed idea of God within ourselves. This strategy differs from the simple remove-the-doubt strategy in its attitude that the pure intellect, once discovered, is to be trusted as an instrument capable of yielding metaphysical truth.

This strategy frees the Third Meditation from the charge of circularity, for it relieves the meditator of the burden of having to prove that clear and distinct perceptions are true. But it raises the question of whether we should accept a presumption in favor of our human cognitive faculties.

In the Fourth Replies, Descartes contends that we normally do make such a (general) presumption, in the course of explaining why his proof for the mind–body distinction had to wait until the Sixth Meditation.

> I would have added nothing more in order to demonstrate the real distinction between mind and body, since we commonly judge that all things are constituted the same way in actual reality as they are in our perception. But one of the hyperbolical doubts that I put forward in the First Meditation went so far as to prevent me from being certain of this very point (namely, that things are in reality just as we perceive them) so long as I was supposing myself to be ignorant of the author of my being.
>
> (7:226*)

Leaving aside the point about mind and body, the passage says that we "commonly judge" that reality corresponds to our (intellectual) perception of it. Here is a direct statement of a presumption in favor of the intellect.

The quotation implies that to prove the mind–body distinction, knowledge of God's existence and perfection is needed. Is Descartes saying that he had to prove God's existence in order to get a divine guarantee for clear and distinct perception? Or rather that he examined his knowledge of God so as to see that the "hyperbolical doubts" of the First Meditation are ridiculous and should be dismissed? If the first, he is following a strategy other than presumption. The second tack is consistent with the presumption strategy, which can be pursued a step further.

Recall that in the natural light passage, Descartes said that what is revealed by the natural light "cannot in any way be open to doubt," because "there can be no other faculty that I could trust as much as this light and that could teach me that such things are not true" (7:38–39). Clearly, it does not follow from the fact that the natural light is our most trustworthy faculty that it cannot be defective. Additional considerations must be at play.

The passage does not say that natural light cannot be defective, only that its results cannot be doubted. Why should this follow from the fact that there is no other faculty capable of showing us that the natural light is defective? It might simply be that no doubt can be posed about the natural light itself, since it is our most trusted faculty and so must be used to evaluate any ground for doubt. To put the point loosely, reason can't undermine itself. As the arbiter of doubt, it is above the fray.

As we granted in Chapter 3, the process of doubt relies on a reasoning faculty to carry it out, because it involves the presentation of arguments. By itself, however, this merely provides us with grounds not to abandon the natural light as an adjudicator of reasons for doubt. It does not give us any reason to trust the natural light in establishing positive metaphysical results. For that we would need something further, which might be gained by reading the passage as an instance of presumption. Descartes might here be suggesting that it simply is not reasonable to

doubt our best cognitive performances without reason. Indeed, in the Geometrical Arguments, after noting that, by contemplating clear and distinct ideas, readers should achieve better awareness of their purely intellectual perceptions and notice that they have always been reliable, he conveys that it would be "irrational" to doubt such perceptions "merely because of preconceived opinions based on the senses, or because of mere hypotheses which contain an element of the unknown" (7:164), which must include the deceiving-God and defective-origins hypotheses. Accordingly, although the deceiving-God hypothesis at first seemed like a good reason, after improving the clarity of our thought through the *cogito* exercise we are better able to evaluate it. Having achieved our best cognitive ability, we find that God exists and is no deceiver. The doubt is removed and the presumption in favor of the human intellect remains unchallenged.

This result is not circular, although it might have other defects, such as begging the question in relation to the defective-origins hypothesis. We return to that problem in Chapter 7.

STRONG VALIDATION

A final reading of Descartes' aims is implicit in Arnauld's charge. He accused Descartes of relying on clear and distinct perception not merely to establish "certainty, not truth," or to "remove the doubt" so as to leave a "presumption" in favor of the intellect, but to prove the existence of God as creator of our cognitive faculties, who guarantees those faculties and stands behind the truth of clear and distinct perception. This conforms to a "strong validation" reading.

Although Descartes did not accept this construal in replying to Arnauld, he did understand the question of whether the human intellect actually represents things as they are in themselves. The presumption passage itself raises this question only to put it aside, and Descartes acknowledges it elsewhere (e.g., 7:150–51). Moreover, some of the arguments in Meditations 4–6 raise this question. And in any case, leaving aside Descartes' intentions, we should ask whether he needed strong validation, given his metaphysical ambitions.

The Third Meditation provides some resources toward achieving strong validation. The extraction argument, if correct, would provide independent grounds for believing in the truth-presenting character of clear and distinct perception. The argument was advanced on the basis of the *cogito* alone. Although the resulting truth rule remained in doubt pending assessment of the deceiving-God hypothesis, one might contend that the extraction argument supplies a legitimate method for investigating that hypothesis as a ground for doubt. The meditator would use the independently legitimated truth rule to prove the existence of God, but God's existence and perfection would play no validating role except to establish the emptiness of the deceiving-God hypothesis as a ground for doubt. The second proof for the existence of God supports the notion that any being that could create or conserve a finite mind would have to be God, who is perfect and hence would not create a defective intellect.

More generally, the natural light passage says that the light cannot be put in doubt because there is no other faculty for checking it. Perhaps Descartes was after all suggesting that the "highest appeal" status of the natural light offers grounds for its absolute indubitability and absolute truth. But that argument is hard to swallow. The need to use a reasoning faculty in adjudicating the doubt does not seem to require that the faculty be able to deliver absolute truth, or that the faculty be able, as Descartes ultimately claims, to sustain metaphysical conclusions about things as they are in themselves. However, the natural light passage adumbrates another argument, in the Sixth Meditation, where Descartes invokes God as the supplier of our faculties and argues that, since he gave us no further faculties for checking their results, they can be trusted, on pain of God being a deceiver (7:79, 80; see also 7:144). In that case, the passage might prefigure subsequent grounds for a divine guarantee of clear and distinct perception. On this strategy, the proof of God's existence and perfection would be needed to guarantee that the natural light, or clear and distinct perception, yields truth.

The strong validation argument promises to establish the absolute ability of the human intellect to certify the first principles of metaphysics. These principles include not only the existence

and attributes of God but also, subsequently, the essences of things. It was Descartes' goal to achieve such results. Still, the reasoning offered thus far in support of strong validation, whether appealing to God or relying on the extraction argument, appears circular. The extraction argument, in particular, seems ready to break the traditional Cartesian circle by establishing the truth of clear and distinct perception independently of God's guarantee. And yet, how is that argument to be assessed, except through clear and distinct perception itself? This assessment does not merely examine some grounds for doubt; it must establish the truth of an argument that establishes the reliability of a truth-discerning faculty, which itself is used to evaluate the argument.

Meditations 4–5 contain additional passages relevant to the circle. We should keep in mind the four readings outlined here (especially the final three) as we proceed. We should also consider whether, beyond these, Descartes had other resources for addressing the problem.

REFERENCES AND FURTHER READING

Many discussions of the Third Meditation focus on the metaphysical apparatus used in proving the existence of God – formal and objective reality of ideas, and the causal principle – along with the notorious Cartesian circle. The books of Carriero, Curley, Flage and Bonnen, B. Williams, and M. Wilson offer much. Dicker's accessible treatment includes the extraction argument.

A good entry into Descartes' theory of ideas is Kenny, ch. 5. See also Norman J. Wells, "Objective Reality of Ideas in Descartes, Caterus, and Suárez," *Journal of the History of Philosophy* 28 (1990), 33–61, Deborah J. Brown, "Descartes on True and False Ideas," in Broughton and Carriero, 196–215, and David Rosenthal, "Will and the Theory of Judgment," in A. Rorty, *Descartes' Meditations*, 405–34. My account of Descartes' theory of ideas has affinities with Grene, ch. 1; see also Guèroult, *Descartes' Philosophy*, vol. 1, ch. 5. On innate ideas, see Alan Nelson, "Cartesian Innateness," in Broughton and Carriero, 319–33.

Descartes' proofs for the existence of God "from effects" belong generically to a type associated with Thomas Aquinas. For

Aquinas, the effects include change in the world, the existence of contingent beings, and the existence of order; see Étienne Gilson, *Philosophy of St. Thomas Aquinas*, trans. E. Bullough (Cambridge: Heffer, 1929), chs. 4–5. Descartes' first proof, starting from the idea of God in the human mind, contrasts with Aquinas' focus on nature and its order. His second proof, explaining the existence of a finite being, is closer to Aquinas. Both proofs echo an Augustinian theme of moving from the imperfection of the human mind to an infinite mind as a comparison against which our finiteness and imperfection are understood (see also 7:53). On Descartes' relation to Augustinian thought, see Menn. The hierarchy of being of the first proof had both Platonic and Aristotelian precedents; on the Aristotelian background, see E. J. Ashworth, "Petrus Fonseca on Objective Concepts and the Analogy of Being," in Patricia Easton (ed.), *Logic and the Workings of the Mind: The Logic of Ideas and Faculty Psychology in Early Modern Philosophy* (Atascadero: Ridgeview Publishing, 1997), 47–63. Secada, *Cartesian Metaphysics*, examines the relations between Cartesian and scholastic metaphysics. On the ideas of God as used in the proofs, see Jean-Marie Beyssade, "The Idea of God and the Proofs of His Existence," in Cottingham, *Cambridge Companion*, 174–99. On Descartes' causal principles, see Tad M. Schmaltz, "Causation and Causal Axioms," in Detlefsen, 82–100. On the notion of a "rational distinction" (such as between conservation and creation), see *Principles*, I.62 (Miller and Miller translation). CSM translates *ratio* as "conceptual" in this context and Moriarty as "in our thought"; each captures the spirit of the distinction but also runs counter to established terminological traditions.

The literature on the Cartesian circle is large and varied. Willis Doney (ed.), *Eternal Truths and the Cartesian Circle: A Collection of Studies* (New York: Garland, 1987), contains seminal papers. Louis Loeb, "The Cartesian Circle," in Cottingham, *Cambridge Companion*, 200–235, provides an entry and ponders certainty or truth. Frankfurt argues that Descartes was not seeking truth in the classical "correspondence" sense (correspondence of thought with knower-independent objects) but held a coherentist view (we accept beliefs that best cohere among themselves).

Broughton, ch. 9, develops a version of strong validation. Rubin presents a version of the "remove the doubt" strategy with hints of strong validation. The present analysis is elaborated in Hatfield, "The Cartesian Circle," in Gaukroger, *Descartes' Meditations*, 122–41.

6

JUDGMENT, ERROR, AND FREEDOM

MEDITATION 4: TRUTH AND FALSITY

At the end of the Third Meditation, the meditator remarks that God's perfection is inconsistent with deception, hence he cannot be a deceiver. The Fourth Meditation examines this conclusion in relation to the fact of human error, which had seemed incompatible with divine nondeceptiveness (7:21). This inquiry analyzes human judgment into two factors, intellect and will, and explores notions of free will. In addition, the Synopsis promises that this Meditation proves "that everything that we clearly and distinctly perceive is true" (7:15), which implies that the real argument for the truth rule occurs here. And, indeed, this Meditation goes beyond merely observing an incompatibility between deception and God's perfection. It argues that God's role as creator, paired with his perfection, entails that he would create us so that we can avoid error and reach truth. God guarantees that our faculty of judgment is a truth-finder.

REVIEW: IMMATERIAL THINGS KNOWN WITHOUT IMAGES (7:52–53)

The meditator undergoes the now familiar review of her cognitive situation. She proclaims her epistemic achievements: "In these past days I have accustomed myself to withdrawing the mind from the senses; and I have taken careful note of the fact that there is very little about corporeal things that is truly perceived, whereas much more is known about the human mind, and still more about God" (7:52–53).

Not only does she have new knowledge about God and the human mind, she also has gained a new cognitive procedure for achieving knowledge. She now has no difficulty "in turning my mind away from imaginable things and to things that are intelligible only and indeed separated from all matter" (7:53). Although she is not yet prepared to claim that the human mind is fully distinct from matter, her idea of mind portrays it as immaterial; she has a clear idea of mind "insofar as it is a thinking thing, which is not extended in length, breadth, and height, and has no other bodily properties" (7:53).

The meditator also reports her firm conviction, from the Third Meditation, that God exists. And now, "from this contemplation of the true God," she can "see a way forward to the knowledge of other things" (7:53).

GOD IS NO DECEIVER (7:53)

She rehearses her brief argument, from the Third Meditation, that God is no deceiver:

> First of all, I recognize that it cannot happen that God would ever deceive me. For in all trickery or deception some imperfection is to be found; and although the ability to deceive appears to be an indication of cleverness or power, the will to deceive undoubtedly indicates malice or weakness and therefore does not apply to God.
>
> (7:53)

God is not a trickster; although he has the ability, he does not deceive us. This language might simply rule out that God would

deceive us through active interference, as in the intervention hypothesis from Chapter 3 (God intervenes to give us false thoughts). In that case, God's nondeceptiveness would offer no positive grounds for asserting that clear and distinct perceptions are true. It would only say that, supposing that, on our own, we naturally can attain the truth, God will not step in to trick us.

IMPLICATIONS FOR MY MENTAL POWER (7:53–56)

In further considering God's perfection and the possibility of human error, the meditator returns to the issues from the First Meditation concerning the origin of her mind and its cognitive faculties. God's purported role as creator of the human mind, joined with this perfection and nondeceptiveness, undergird the trustworthiness of human cognitive faculties.

She reasons:

> Next, I know by experience that there is in me a faculty of judging which, like everything else that is in me, I certainly received from God. And since he does not wish to deceive me, he surely did not give me the kind of faculty that would ever enable me to go wrong while using it correctly.
>
> (7:53–54)

The argument concerns the original constitution or design of our faculties. God made us and he would not deceive us. Hence, he would not create us with a faculty that would allow us to go wrong irremediably. For, if God gave us a faculty that inevitably leads to errors (no matter how careful we may be), then, as our designer, he would be responsible for the errors themselves.

Thus far, the argument does not establish that any finite cognitive being must have faculties that yield truth. The condition that error can be avoided might be met in other ways. For instance, God might have created us with very limited faculties but provided us with a natural impulse to act according to probabilities without affirming anything as true. Such beings might negotiate the necessities of survival reasonably well; but they would avoid false judgment only by never affirming the truth or falsehood of

anything. However, the meditator does not consider this possibility and keeps her focus on God's relation to her mental powers as means for both avoiding error and attaining truth.

She now considers a problem analogous to the theological problem of evil. If God is perfectly good and can do anything, why is there evil in the world? If God is no deceiver and can do anything, why doesn't he make us so that we never make cognitive mistakes at all? Yet there is evil, and we do make mistakes.

In reply, Descartes drew upon two standard responses to the problem of evil, both stemming from Augustine's Neoplatonic theology. The first equated perfection and goodness with being. Only God contains every perfection, or truly complete being. All else has lesser being. Evil is the absence of perfection and goodness; it is not a positive quality but, like cognitive error, is a form of "nothingness" or "non-being" (7:54). Human beings engage in bad behavior not because they are attracted to an existent quality called "evil," but because they have an imperfect knowledge of the good. In this sense, evil is not a real entity. Therefore God does not, strictly speaking, create evil. Since the created world cannot equal God's own perfection, if he creates at all, he must produce things that partake of nothingness and non-being. The various created things fall short of his perfection in various ways.

How shall an all-perfect creator organize a creation that must fall short of perfection? Here the second response comes in. A universe with variety in it, including things that are both closer to and further from perfection, is better than a universe in which less perfect beings are left out. As the meditator reasons subsequently, "there may in some way be more perfection in the universe as a whole because some of its parts are not immune from error, while others are immune, than there would be if all the parts were exactly alike" (7:61). Variety is the spice of creation. Creation may be better for including beings who can make mistakes (and, in any event, God's purposes exceed our knowledge [7:55]).

These two responses do not exhaust Descartes' analysis of the possibility of human error. The meditator now looks into the nature of the errors that she makes. This involves examining her faculty of judgment and finding the conditions for error. In this context, she does not treat "error" as a simple matter of being

wrong; it involves being wrong when we should be able to avoid it. Error is a matter of epistemic irresponsibility, of judging when we have insufficient grounds to do so. God, being all-powerful, could have avoided the whole issue by making us so that we never judge falsely (7:55), hence never err cognitively in any sense. (For instance, he might have preprogrammed us with all the right answers.) So why does he allow us ever to judge falsely? Descartes again offers a solution along Augustinian lines. Our epistemically irresponsible judgments arise from something good that God gave us: freedom of will. Let us see how.

ANALYSIS OF JUDGMENT: INTELLECT/WILL (7:56–57)

The further account of error requires an explanation of how judgment occurs. Judgment depends on two faculties, the "intellect" or "faculty of cognition," and the "faculty of choice" or "freedom of will" (7:56*). The intellect is a faculty of cognition or representation; it (passively) perceives ideas, that is, it is aware of the objective reality, or content, of ideas. The will (actively) affirms or denies what is represented in such ideas. A judgment occurs when the will acts and consists of both the idea and the act. Technically speaking, a false thought can arise only if a content (in the intellect) is affirmed or denied. In this sense, falsehood requires the act of the will. The intellect cannot by itself commit a mistake, because it cannot assert (affirm or deny) anything.

The Fourth Meditation provides only a sketch of how intellect and will interact in judgment. Through the intellect itself, "I only perceive the ideas about which I am able to make a judgment; and, properly speaking, no error is to be found in it [the intellect] when regarded precisely so" (7:56). The will responds to this content presented by the intellect. It may affirm the content, deny it, or refrain from judging (7:57, 59). (Note that such refraining may also result from judgment [4:173]; however, Descartes usually means by "judgment" affirmation or denial, and I follow suit.)

Descartes' account of judgment can be filled out through comparison with its scholastic Aristotelian counterpart and by looking

to other parts of the *Meditations*. On standard scholastic accounts, the intellect judges. It affirms or denies the content present in it. It also perceives and affirms logical connections among contents, as in syllogistic reasoning. In Descartes' account, the will, not the intellect, does the affirming or denying. But perception of the relations and connections among ideas remains a job for the intellect, as when we perceive what properties flow from the essence of a triangle (7:64). Only if the will affirms or denies the relations or connections do we have a judgment.

According to Descartes, the ideas we have of things present those things as having properties. Triangles are perceived as essentially having three sides and three angles, as being closed plane figures, and so on. Moreover, the clear and distinct ideas we have of finite objects such as triangles present them as possibly existing; a clear and distinct idea of a thing includes the perception that it could exist (7:383). In this way, clear and distinct ideas present us with a content that is "true" (7:46) – even if those ideas, strictly speaking, are not bearers of truth because, without an act of will, a bare idea does not take a stand on its truth. Other ideas do not present things but principles, such as that equals added to equals yields equals (8A:9; also, 5:153).

When presented with the idea of a triangle and two right angles, the will might affirm or deny (or suspend judgment on) the content that the angles of a triangle equal two right angles. When presented with the idea of a chimera, the will might affirm or deny its actual or possible existence. When presented with the sequence of ideas allegedly showing that God is no deceiver, the will might affirm or deny that the sequence supports the conclusion. To say that the will is "presented" with these ideas makes it seem as if the will itself must perceive the content of the ideas and then affirm or deny (or suspend). But that would be to ascribe to the will the sort of representational capacity that Descartes restricted to the intellect. Ideas offer contents, and the will is drawn toward them or not. Error (in the sense of epistemic irresponsibility) occurs if the will affirms or denies when it shouldn't (see below).

Our epistemic mistakes involve false judgment. But what do truth and falsity consist of? Here Descartes gave the standard

answer, from Aristotle to Kant. He wrote to Mersenne in 1639 that "the word 'truth,' in its proper signification, denotes the conformity of thought with its object" (2:597). In the case of an actually existing object with certain properties, truth consists in affirming an idea that represents the object as existing and with properties it has; falsity, in judging the existent as non-existent, or the existent as having properties it doesn't have.

ANALYSIS OF ERROR, CONSISTENT WITH GOD'S GOODNESS (7:56–62)

Descartes' job is to provide an analysis of human error that meets the conditions so far set out. The meditator needs to assure herself that, consonant with God's perfection and goodness, each of our human faculties is "perfect of its kind" (7:55). Both the intellect and will, taken in themselves, must be free of defect. She must now find what it is that should occur in the interaction of intellect and will but does not in cases of error.

As we have seen, since "through the intellect alone I only perceive the ideas about which I am able to make a judgment" (7:56), it contains no error. In this respect, it is as good as need be. That does not mean it is the best possible intellect; God's infinite intellect is far above it. Our intellects, being finite, do not contain ideas of everything. Nor should they; there is no reason why God should have given us a greater faculty of cognition (a better stocked intellect) than he did. (We should not rail against the way God created us.) Moreover, because our intellects come from God (who is no deceiver), whatever we do understand, we "understand correctly" (7:58).

The will is also perfect of its kind. In fact, it is as perfect as can be: "it is only the will, or freedom of choice, that I experience within me to be so great that I can grasp the idea of none greater; so much so that it is especially in virtue of it that I understand myself to bear in some way the image and likeness of God" (7:57). Like God's will, our wills are totally free. In our case, the will consists in "our ability to do or not to do something (that is, to affirm or deny, to pursue or avoid)" (7:57), and as long as we are not constrained by outside forces in performing these acts, we

are free. Our judgments, as depending on the will, are up to us. (This does not mean that they cannot be determined by our nature – Descartes' conception of freedom is taken up in the next section.)

In our accounting thus far, neither the intellect nor the will is culpable for error. Rather, error originates from the relation between them. The will's freedom is so great that it overflows the boundary of the intellect's clear and distinct perceptions; we make judgments about ideas that are not perceived with sufficient clarity and distinctness.

> So where do my errors come from? Surely from this one thing: the scope of the will is wider than that of the intellect, but instead of restricting it within the same limits, I extend it even to matters that I do not understand. Since the will is indifferent in such cases, it easily turns away from the true and the good, and this is the source of my error and sin.
>
> (7:58)

God's perfection means that he gives us faculties that, if used correctly, allow us to avoid falsehood. We go wrong when we judge outside the bounds of clear and distinct perception. In those cases, we are responsible, since it is our choice to make the judgments in question.

On Descartes' account, in theoretical contexts (as opposed to matters of practical necessity), it is always an error to judge matters that we do not perceived clearly. Because error is possible in those cases, it is epistemically responsible not to judge. We are just as much at fault even if our judgments in these circumstances are true, for "I fall upon the truth by chance" (7:60). We err by making judgments in (theoretical) circumstances where we know falsehood can creep in.

Nonetheless, if our intellect is "perfect of its kind," how can it present content that yields false judgment? If everything we understand, we "understand correctly," how can falsehood arise? In cases in which the perception of the intellect is not clear and distinct, the will is free to affirm or deny. Here are some examples of false judgments arising from lack of knowledge. Suppose

someone hears a horse described and forms a reasonably faithful idea of a horse, but without learning whether horses exist. Since, even in good circumstances, the natures of animals "are not completely clear to us" (7:117), the will can judge either way. Suppose it denies that horses exist. Now suppose that someone forms the idea of a chimera without learning whether they exist, and affirms that such beasts do exist. Or suppose that someone joins the sensory idea of color with the thought that colors are real qualities of bodies (5:152), and affirms it (the resemblance thesis). In general, falsehood can arise from affirming or denying things not clearly understood, and contents can arise that don't match the world through combinations of ideas in the intellect (7:445; see also 10:399).

Our errors are our responsibility because we make them freely. Even though he designed our faculties, God is not responsible for our own free use of them. Descartes addresses other details, arguing that the will would not be perfect of its kind if it were artificially limited by God so that it didn't exceed the bounds of clear and distinct perceptions (7:60). We are not truly free, it seems, unless we are free to make mistakes. So God is off the hook for our precipitate judgments. But the Fourth Meditation also asserts that God would be a deceiver if we could go wrong in affirming clear and distinct perceptions. Let us see why.

God's culpability, if clear and distinct perception ever yielded falsehood, would arise from a further aspect of the relation between intellect and will. Descartes held that when we perceive something clearly and distinctly, the will cannot refrain from affirming it:

> when I was examining, in these past few days, whether anything exists in the world, and I observed that, from the very fact that I was examining this point, it evidently follows that I exist, I could not but judge that something which I understood so clearly was true. This was not because I was compelled so to judge by any external force but rather because a great light in the intellect was followed by a great inclination in the will, and in this way the spontaneity and freedom of my belief was all the greater in proportion to my lack of indifference. (7:58–59)

The will is inclined toward the true (and the good), as presented to it by the intellect. (It is as if the will is drawn to the true and the good appetitively.) In the case of clear and distinct perceptions, it is ineluctably inclined to affirm their truth. If we "cannot but judge" some perceptions to be true, we would inevitably go wrong if in fact those perceptions weren't true. Since God made both the intellect and the will and placed them in relation to one another, he would bear the responsibility for a design flaw if perceptions whose truth we cannot help but affirm could ever yield falsehood.

This answer explains why God should be held responsible for the truth of clear and distinct perceptions. But it leads to another problem. How are we truly free in our judging if we cannot help but affirm (sufficiently) clear and distinct perceptions? The answer lies in Descartes' theory of free will.

FREEDOM OF WILL (7:57–59)

Descartes provides a characterization of will, and freedom of will, in the midst of his discussion of judgment and error:

> The will, or freedom of choice, consists simply in our ability to do or not do a given thing (that is, to affirm or deny something, to pursue or avoid it); or rather, it consists simply in the fact that when we are moved to affirm or deny, or to pursue or avoid, what the intellect puts forward, we do not feel that we are determined to do so by any external force.
>
> (7:57)

Many readers find two different conceptions of freedom implied by this passage. The first is freedom of indifference. Such freedom consists in the ability to direct ourselves in one way or the other, that is, to go either way in any given instance. The second conception finds our freedom in our acting in accordance with our own will, without external force or constraint. This is called the freedom of spontaneity (where "spontaneous" means self-acting but not necessarily uncaused). As described by Descartes, this spontaneous choice may be completely determined by our nature.

As he put it in the Second Replies, "the will of a thinking thing is drawn voluntarily and freely (for that is the essence of will), but nevertheless inevitably, toward a clearly known good" (7:166). To be drawn inevitably means that we cannot but so choose. So on this second conception, we are free even if determined, so long as we are determined internally, by the nature of our will.

COMPATIBILISM AND INCOMPATIBILISM

If we take each of these conceptions as a general account of freedom, we are forced to engage the modern problem of compatibilism. A compatibilist holds that freedom of the will is compatible with determinism. That is Descartes' position in the second conception above. An incompatibilist holds that freedom requires the ability to do or not to do without being determined even by our own nature. To be free, we must be able to have chosen the opposite of what we did choose. Descartes seems to say both things about freedom, and thus to contradict himself by holding both compatibilist and incompatibilist views.

However, the two conceptions of freedom we located in the quotation are contradictory only if we treat the first as providing a general definition of, or a necessary condition for, freedom. But we need not do that. Descartes might consistently hold that freedom is compatible with inner determination but also hold that in some circumstances we choose in a way that is not internally determined (not determined by the clear perception of the intellect, or any other factor). He might have affirmed the compatibility of freedom with inner determination, while also allowing that we are not always determined in this way.

There is no doubt that Descartes believed that freedom is compatible with inner determination, for he affirmed this position in the ensuing text:

> In order to be free, there is no need for me to be able to be drawn in both directions; on the contrary, the more I incline in one direction – either because I clearly understand that reasons of truth and goodness point that way, or because God so disposes my inmost thoughts – the freer is my choice. Indeed, neither divine grace nor

> natural knowledge ever diminishes freedom; on the contrary, they increase and strengthen it. But the indifference that I experience when no reason pushes me in one direction rather than another is the lowest grade of freedom; it is evidence not of any perfection of freedom, but rather of a defect in knowledge or a kind of negation. For if I always saw clearly what is true and good, I would never have to deliberate about the right judgment or choice; and so, although I plainly could be free, I could still never be indifferent.
>
> (7:57–58)

We are free when we act from our own choice. That choice may be fully determined by a clear perception of the true or good. Freedom is acting according to our own will, but that will need not be unstructured. In fact, Descartes holds that it is the essence of human will to be drawn toward the true and the good. As he explains in the Sixth Replies (in distinguishing human from divine freedom), "as for human beings, since they find the nature of all goodness and truth already determined by God, and their wills cannot be moved toward anything else, it is evident that they embrace the good and the true all the more willingly, and hence more freely, the more clearly they see it" (7:432). We are naturally determined to affirm the truth and cannot help but do so when we see it clearly and distinctly.

At the same time, Descartes also allowed that humans are free when indifferent between two options. The quotation describes such indifference as "the lowest grade of freedom."

In a letter to the Jesuit Mesland in 1645, Descartes distinguished two senses of such "indifference" (4:173). The first says simply that our perceptions do not presently incline us in one direction or another; we are indifferent because nothing now compels the will. (This sort of indifference is not incompatible with the will being determined by other factors, such as habit, to choose one way rather than another.) He told Mesland (4:173) that he had this meaning in mind in the quotation above. In the same letter, he identified a second meaning of "indifference" as the "positive faculty of determining oneself to one or other of two contraries." This is the ability (in some circumstances) to direct the will to choose in a completely undetermined manner. In the Fifth

Replies, he affirmed that in some cases the will has "the freedom to direct itself, without the determination of the intellect, toward one side or the other" (7:378). Indeed, the letter to Mesland allows that we can "hold back" from a clear and distinct perception of the good or the true "to the extent that we consider it a good thing to demonstrate the freedom of our will by so doing" (4:173). In a previous letter, Descartes had explained how this might happen through a momentary suspension of judgment. Having acknowledged that it is impossible for the will to refrain from affirming a current clear and distinct perception, he maintained that once such a perception has dimmed (or prior to achieving the perception fully) we can "suspend judgment" by bringing forth reasons for doing so (4:115–16). These might be reasons for doubt (as in the case of mathematical propositions), or the reason of wanting to demonstrate one's freedom.

FREEDOM AS THE POWER TO CHOOSE

Descartes has it both ways: in cases of indifference we can choose without being determined; in cases of clear and distinct perception we choose with inner necessity. Does this indicate that Descartes had two conceptions of freedom? Not at all. As he explained to Mesland, in both cases freedom is the power to determine oneself – for even an inner determination is a kind of self-determination!

> And so, since you do not place freedom precisely in indifference but in a real and positive power to determine oneself, the difference between us is merely verbal – for I acknowledge that the will has such a power. But, because I do not at all see that it makes any difference to that power whether it is accompanied by indifference, which you admit is an imperfection, or it is not so accompanied and there is nothing in the intellect except light (as in the intellect of the blessed who are confirmed in grace), I generally call "free" whatever is voluntary, whereas you wish to restrict that term to the power to determine oneself as accompanied by indifference.
>
> (4:116)

It makes no difference to Descartes whether the inner determination comes from the will's response to a "great light in the intellect" (7:59) or from its own determination of choice in the face of indifference (in the second, wholly unconstrained sense from above). Both are instances of freedom. The incompatibilist's concerns are not Descartes' concerns. But neither does he deny an unconstrained power to choose (in some cases).

The central idea in Descartes' response to Mesland is interesting in its own right. He suggests that the power to choose need not imply the ability to choose in more than one way on every occasion. To see how this works, consider a phrase that seems to capture the notion of free will: we can choose what we want. The phrase is intriguingly ambiguous. It can mean: we are able to choose whatever and however we want. The implication here is that the will can choose anything, bounded solely by our ability to conceive what we want. But the phrase can also mean: we are able to choose that which we do in fact want (even if determined by our nature to want it). Here freedom means that, even if our will is built to want specific things, nothing prevents us from choosing the things we want. For Descartes, we want (to affirm or pursue) what is true and good. Freedom of will can mean simply that no external constraint prevents us from actually willing what, by the nature of our will, we are determined to will. Free choice of the former kind, choosing however we want, is limited to cases in which the will is not so determined.

FREEDOM AND ERROR

Assuming this is Descartes' position on freedom, it may seem odd that he would display both an indifferentist and a determinist side of this complicated picture in the midst of the Fourth Meditation. But he had reason to do so. He needed both sides to accomplish his aims. He needed to be able to hold God responsible for the truth of clear and distinct perceptions while also making us responsible for our own mistakes. To accomplish the first, humans must not be able to avoid falsity by suspending judgment in all cases. We are determined (albeit freely) to affirm clear and distinct perceptions, and God would be guilty of deceit-inducing

design if such perceptions were not true. But to preserve God's nondeceptiveness, he must be released from responsibility for our actual mistakes. The freedom of indifference accomplishes this, when we judge without the will being ineluctably drawn. We take responsibility for the false judgments that arise when we affirm or deny something without sufficiently clear and distinct perception.

All cases in which the will is not compelled are instances of indifference (in the first sense, above). Such indifference does not require that the will be in perfect balance, with no reasons "drawing" it to one side or the other; rather, it includes "all things that are not perspicuously enough cognized at the very time in which the will deliberates about them" (7:59*). Probable conjectures may draw the will in one way, but the "mere cognition" (7:59*) that such conjectures are dubitable allows one to suspend judgment or even to affirm the opposite (as the meditator's experience "in these past few days" exemplifies).

We can now consolidate the relation between freedom and error. We err, or are epistemically irresponsible, in departing from the rule that (in theoretical contexts) only sufficiently clear and distinct perceptions should be affirmed.

> If, however, I simply refrain from making a judgment when I do not perceive the truth clearly and distinctly enough, then it is clear that I am acting correctly and do not go wrong. But if I either affirm or deny, I am not using my freedom of choice correctly. If I go for the alternative that is false, then obviously I go wrong; if I take the other side, then I fall upon the truth by chance, and I will still be at fault since it is manifest by the natural light that the perception of the intellect should always precede the determination of the will. In this incorrect use of free choice lies the privation that constitutes the essence of error.
>
> (7:59–60)

In our quest for theoretical knowledge, if we are faced with uncertainty, we should withhold judgment rather than follow confused perceptions, habits, or preconceived opinions. In this context, even if we hit upon the truth, we are guilty of error as Descartes defines it. Of course, in practical situations, where we

often must "act without delay" (6:25) and without certainty or even probability, there is no error in acting without clear and distinct perception (7:149). Indeed, in such situations we should follow our first judgment, no matter how poor its foundation, so as to pursue a constant plan of action (until met with reasons not to).

Descartes' reconciliation of divine perfection and omnipotence with human error is not without problems. He acknowledges that a God who can do anything could leave us our freedom and still preserve us from mistakes. God could have "so firmly impressed it on my memory, never to make a judgment about anything that I did not clearly and distinctly understand, that I could never forget it" (7:61). To respond, Descartes must either fall back on our ignorance of God's plan – that is, on the mystery of God's ways (7:55) – or affirm that since variety yields greater perfection, we ought not complain about our degree of perfection (7:61). Still, his joining of two conceptions of freedom to make God's perfection the basis for a divine guarantee of the truth rule while leaving responsibility for our mistakes to us, is admirable for its subtlety and skill.

CLEAR AND DISTINCT PERCEPTION IS TRUE (7:62)

Descartes returns to the truth of clear and distinct perceptions and leaves no doubt that he has intended to reveal a divine guarantee for their truth:

> every clear and distinct perception is undoubtedly something, and hence cannot come from nothing but necessarily has God for its author. Its author, I say, is God, who is supremely perfect, and who cannot be a deceiver on pain of contradiction; hence, such perception is undoubtedly true. So today I have learned not only what precautions to take to avoid ever going wrong, but also what to do to attain the truth.
>
> (7:62)

The warrant for clear and distinct perception comes from God. The argument does not merely preclude God from intervening to

trick us. God has responsibility for creating a human intellect with its clear and distinct perceptions and a will that must assent to them.

THE TRUTH RULE AND THE WILL

In his Objections, Gassendi insists that Descartes furnish a method for discovering when we have clear and distinct perceptions, since we can believe we do when we don't (7:318) – an objection he previously raised (7:277–79) regarding the truth rule of the Third Meditation. Descartes counters that he has already proffered a method "for determining whether we are mistaken or not, when we think we perceive something clearly" (7:361). He has done so "in the appropriate place, where I first eliminated all preconceived opinions and afterwards listed all my principal ideas, distinguishing those that were clear from those that were obscure or confused" (7:362).

The method of doubt, the discovery of the thinking thing, and the idea of God provide a method for discerning when our perceptions are clear and distinct. What is the common factor to suggest that a "method" is at work? In Chapter 5, we saw Descartes directing the reader to find what is common in cases of clear and distinct perception by considering examples; in effect, that is his reply here as well. However, using the Fourth Meditation, we can propose a more definite criterion of clarity and distinctness, namely, the absence of indifference or uncertainty in the will. In the *cogito* reasoning, the will is compelled by the "great light" in the intellect (7:58–59). There is no indifference. The idea of God is "maximally clear and distinct" (7:46), not permitting uncertainty about its truth. With "previous beliefs" doubt is possible, a sign of indifference (7:59). Indubitability is a sure sign of clear and distinct perception (the will is compelled); indifference and uncertainty, which permit doubt, are sure signs that such perception has not been achieved.

Still, might we mistake whether the will is compelled? Could we not confuse force of habit, or stubborn belief, with genuine compulsion? Gassendi observes that some people face death for their convictions and others for opposite convictions (7:278).

Since, presumably, both parties can't be right, at least one died for a falsehood. Descartes grants the facts but responds that "it can never be proved that they clearly and distinctly perceive what they so stubbornly affirm" (7:361). On the other side, however, it cannot be proved in any given case that we do not mistake clear and distinct perception for habit or stubbornness. In other cases, we might possess clear and distinct ideas but not focus on them sufficiently for the will to be compelled. Descartes may have no response, except to recommend caution or repeated meditation.

THE DIVINE GUARANTEE AND THE CIRCLE

In Chapter 5, we considered four responses to the problem of the Cartesian circle: "certainty, not truth," "remove the doubt," "presumption in favor of the intellect," and "strong validation." The divine guarantee at the end of the Fourth Meditation apparently runs counter to the first three. Regarding the first, the claim that clear and distinct perception yields truth contradicts the proposal that Descartes was after mere psychological certainty. With the second, his appeal to God's certification of clear and distinct perception does more than simply "remove the doubt" that a deceiver might be at work. And while Descartes may have accepted a general presumption in favor of the intellect, in the Fourth Meditation he offers more: a strong external validation of the intellect. The Meditation supports ascribing a strong validation strategy to Descartes.

That strategy has its costs. To the extent that the actual existence of God the creator is required by the arguments of this Meditation, Arnauld's original objection of circularity arises. Having used clear and distinct perception to prove God's existence and perfection in the Third Meditation, the meditator would now be appealing to God's existence and perfection to guarantee the truth of clear and distinct perception in the Fourth.

Although the Fourth Meditation appears to aim for strong validation, we might seek instead to read it through the "remove the doubt" or "presumption" strategies. Perhaps examining the view that a nondeceiving God created our intellect and will simply provides firmer grounds for removing the deceiving-God

hypothesis. Accordingly, strong validation is not intended – only thorough support for the conclusion that the deceiving-God hypothesis has internal problems. On the presumption reading, one might hold that, in this Meditation, Descartes was not really out to validate clear and distinct perception but to explain how the reality of human error is consistent with the perception that God exists and is no deceiver. The problem with this last interpretation is that, in the Synopsis, Descartes says that the "clear and distinct" truth rule is first established in the Fourth Meditation. If we read the Meditation as providing the argument for this rule, it is difficult to avoid strong validation.

The Meditations don't stop here, and neither should our interpretation of Descartes' responses to the circle. In reply to Arnauld, he distinguished having a clear and distinct perception from remembering having had one, a point that he discusses extensively in the Fifth Meditation. Moreover, it may be that Descartes had more than one argument for his truth rule. In that case, perhaps some fall prey to the charge of circularity and some don't.

REFERENCES AND FURTHER READING

Commentaries sometimes omit the Fourth Meditation (e.g., Curley). Carriero, ch. 4, Dicker, ch. 4, Kenny, ch. 8, M. Wilson, ch. 4, and B. Williams, ch. 6, examine will, judgment, and error.

In this Meditation, knowledge, expressed in judgments, must be distinguished from unadjudicated cognitions (ideas, representations) of the intellect. Where CSM and Moriarty translate both *scire* and *cognoscere* as "knowledge" (7:59), I translate *cognoscere* and kin as "cognize" or "cognition."

Menn, ch. 7, explores Augustinian elements in Meditation 4; see also C. Wilson, "Descartes and Augustine." Kenny, "Descartes on the Will," in Cottingham (ed.), *Descartes*, Oxford Readings in Philosophy (Oxford: Oxford University Press, 1998), 132–59, discusses the intricacies of will in this and other Cartesian texts. Vere Chappell, "Descartes's Compatibilism," in Cottingham (ed.), *Reason, Will, and Sensation: Studies in Descartes's Metaphysics* (Oxford: Clarendon Press, 1994), 177–90, examines the indifference and spontaneity conceptions of freedom in connection with the

Jesuit Mesland (with scholastic Aristotelian leanings) and the Oratorian Gibieuf (with Augustinian and hence Neoplatonic leanings).

Rosenthal, "Will and Theory of Judgment" (in A. Rorty), and Lilli Alanen, "The Role of Will in Descartes' Account of Judgment," in Detlefsen, 176–99, analyze Descartes' theory of judgment in detail; for an introduction to the topic, see Lex Newman, "Descartes on the Will and Judgment," in Broughton and Carriero, 334–52.

7

MATTER, GOD, AND THE CIRCLE AGAIN

MEDITATION 5: THE ESSENCE OF MATERIAL THINGS, AND THE EXISTENCE OF GOD CONSIDERED A SECOND TIME

The Fifth Meditation opens with the meditator resolving "to try to emerge from the doubts into which I fell in previous days and see whether any certainty can be achieved regarding material objects" (7:63). Having achieved some knowledge of God and of herself as a thinking thing, it is time to move on. The Meditation's title promises discovery of the "essence of material things."

Meditation on this essence occurs early and is over quickly. Its discovery leads the meditator (in accordance with the analytic method) to reflect on how that knowledge arose, and she finds that it depends on innate ideas (7:64–68). She has already uncovered, in the Third Meditation, her innate idea of God. Now she makes additional discoveries, or at least additional claims, concerning innate ideas. First, she affirms that such ideas reveal the "true and immutable natures" of things (7:64). This discovery

leads to a new proof for the existence of God, which in turn leads to reconsideration of the grounds for doubt and the truth of clear and distinct perception. Although achieving new positive results, the Meditation is equally devoted to methodological reflection. Of all the Meditations, it addresses most explicitly the question of how metaphysical knowledge arises.

ESSENCE OF MATTER IS EXTENSION (7:63, 71)

The Third and Fourth Meditations propounded clear and distinct intellectual perception as the way to truth. It makes sense, then, for the meditator to say, concerning material objects: "before I inquire whether any such things exist outside me, I must consider the ideas of these things insofar as they exist in my thought and see which of them are distinct and which confused" (7:63). The meditator's emergence from doubt proceeds not via the existence of material objects but by investigating her ideas of such objects.

It may seem natural for the meditator to turn to her ideas of material objects before considering their existence, since in the Second Meditation she explored her nature as a thinking thing by examining her own thoughts, apart from the material world, and in the Third Meditation she inventoried her ideas before finding a proof for God's existence. However, for Aristotelian readers, this method would seem revolutionary, as they held knowledge of existence to precede that of essence. In their methodology, essences are known by contemplating sensory images of existent things and "abstracting" the common natures of such things – whether the nature of one kind of thing, such as a rabbit, or the essence of extension, considered simply as a property that all bodies happen to have.

There is some ambiguity in Descartes' procedure. When the meditator decides to "consider the ideas of these things insofar as they exist in my thought," she is speaking of material objects. Does she mean the sensory ideas of material objects, such as she initially scrutinized in the wax? Or has she already made the transition, facilitated by the wax discussion (7:31, 43), to thinking of material objects as "pure extension"?

As it happens, although she may begin with sensory ideas (and this would explain why she calls them ideas of "material objects"),

she soon turns to nonsensory ideas of geometrical objects. Descartes has prepared Aristotelian readers for this transition through meditations on self and God. An Aristotelian would believe that those meditations, too, must always involve sensory images. And yet the meditator has "withdrawn the mind from the senses" in carrying them out. Assuming that she has been able to follow this instruction and has found the ideas that Descartes expected (no small assumptions!), the way has been prepared for investigating even material things in this manner. (Indeed, Meditation 6 explicitly claims that the essence of material things can be grasped independently of any sensory or imaginal ideas [7:72–73].)

Seeking what is "distinct" in her ideas of material objects, the meditator finds:

> I distinctly imagine the quantity that philosophers commonly call "continuous," or the extension of the quantity – or rather of the thing to which quantity is attributed – in length, breadth, and depth. I count various parts within it; to these parts I assign various sizes, shapes, positions, and local motions; and to the motions I assign various durations.
>
> (7:63)

Note that she distinctly "imagines" continuous quantity or extension, consistent with starting from sensory (or sense-based) ideas. But she describes this quantity (or thing quantified) in mathematical language, thereby preparing the way, in the ensuing text, for the transition to purely intellectual ideas of geometrical objects (discussed in the next section).

This brief passage lists the properties that form or follow from what Descartes will subsequently identify, in the final sentence of this Meditation, as "corporeal nature," which is the "essence" of matter promised in the title of the Meditation. (The properties of number and duration, also listed, Descartes ascribes to all finite substances, including minds.) Extension, or continuous quantity, is the essence of matter. Extension should be thought of as a three-dimensional spatial field – with the qualification that Descartes did not distinguish space from matter. Cartesian extension is a three-dimensional volume of matter. This volume is divided into parts

that possess sizes, shapes, positions, and local motions. The division into parts allows for enumeration, or counting of the parts, and for motion of the parts, which requires that they exist over time.

Assuming that these distinct perceptions reveal the "essence of material things," we may ask whether this brief discussion constitutes the discovery that matter is nothing but extended substance. In the Second Meditation, the meditator regarded her mind as an otherwise unknown thing or substance, whose nature was to be a thinking thing. Descartes seems to be claiming more for the current perception of extension. In the remaining text, there are two brief mentions of the essence or nature of matter (7:71, Meds. 5 and 6), before extension is invoked as matter's essence in the argument for mind–body distinctness (7:78). What sustains Descartes' confidence that this brief argument reveals the essence of matter? According to the Synopsis, he can make stronger claims here than in Meditation 2 because the intervening Meditation 4 has proven that "everything that we clearly and distinctly understand is true just as we understand it" (7:13). The Synopsis also locates development of the "distinct concept of corporeal nature" in Meditations 2, 5, and 6. So, in building on the wax argument here, Descartes does claim to discover the essence of matter, a finding he consolidates in Meditation 6.

Accordingly, the above passage outlines Descartes' metaphysics of material substance, without trumpeting that fact. We can fill out his account from the *Principles* and Replies. In the *Principles*, he explains that each substance has a "principal attribute" or "property" that "constitutes its nature and essence, and to which all its other properties are referred" (8A:25), including all its modes. He identifies extension as the principal attribute of material substance (and thought as the principal attribute of mental substance) and assigns size, shape, position, and local motion as modes or modifications of that attribute. These modes must be understood through the principal attribute (8A:25–26; see also 7:120–21). To understand a mode through an attribute is to grasp it as a limitation or modification of that attribute. Although one can understand an attribute without thinking of a particular mode, one cannot think of a particular mode without thinking of the attribute. While we can think of extension without

motion, we cannot think of motion without an extended area to traverse. Similarly, size, shape, and position are modifications of extension that arise by introducing boundaries (hence creating parts) in the field of extension. But we can also understand an indefinitely large field of extension without thinking of particular sizes, shapes, and positions. (Because the field of extension is conceived as indefinitely large, Descartes avoids assigning it a boundary, hence a size and shape; and since he posited no space "outside" the field of extension, that field has no position – rather, position is defined within the field of extension, by relations among parts.)

In his proposal that the essence of material substance is extension, Descartes not only violated Aristotelian epistemology by claiming to know this essence independently of existence, but he also contradicted the basic conception of corporeal or bodily substance in Aristotelian physics. All Aristotelian corporeal substances possess active natures that direct their motion – where "motion" is broadly defined to include qualitative changes (e.g., from cold to hot), mineral processes (magnetic attraction), and biological and psychological processes (bodily growth and the acquisition of knowledge). The bare property of extension, which contains no notion of activity or any principle of growth or change, was not a candidate to be the essence (or substantial form) of a substance. Extension was most commonly regarded as a "universal accident" of all bodily things. All bodies take up space, or have extension, but no corporeal thing could exist having extension as its sole property (i.e., without having a substantial form or active principle of change). But the meditator claims to find that what is distinct in her thoughts of bodies consists precisely in ideas of extension and its modes.

INNATE IDEAS OF ESSENCES (7:63–65)

Having achieved a clear idea of extension, the meditator reflects on this knowledge:

> Not only are all these things entirely known and transparent to me when regarded in this general way; but in addition there are countless

> particulars regarding shape, number, motion, and the like that I perceive by paying attention to them – particulars whose truth is so accessible and so suited to my nature that, when I first discover them, it seems that I am not so much learning something new as remembering what I already knew before or noticing for the first time things that were long present within me although I had never turned my mental gaze on them before.
>
> (7:63–64)

Descartes makes four points concerning the meditator's contemplation of her "distinct" ideas of extended things, which in turn reveal his model of how basic metaphysical truths are known. First, these ideas (of extension, shape, size, etc.) are "entirely known and transparent," that is, clear and evident. Second, other knowledge of "shape, number, [and] motion" – all instances of geometrical or arithmetical cognition – arises from attending to distinct ideas of extension, its parts and modes. These ideas are cognitively complex and support a wider system of knowledge; they are epistemically fecund. Third, in comparing such knowledge to remembering, he alludes to Platonic reminiscence, according to which all knowledge is innate. (In the *Phaedo*, Plato suggested that such knowledge is innate because revealed directly to the soul prior to bodily incarnation. Descartes, by contrast, held that innate ideas are placed in the mind by God and so did not hold that the mind directly perceives Platonic Forms or eternal essences independently of God.) And, fourth, he describes the knowledge not only as "accessible" but also as "suited to" the meditator's nature – that is, easy for her to think about – although newly discovered to be so. Further, in characterizing the ideas as both "clear" (7:64–65) and "distinct" (7:63), he indicates their strong epistemic credentials.

These four properties of the ideas of extended things – transparency, fecundity, innateness, and suitability – tell the meditator what it is like to become aware of her innate ideas. The surrounding discussion provides a kind of phenomenology of intellectual perception. Innate ideas are not entities constantly present to the mind like raisins in a cake; rather, we are able to form these ideas in virtue of our natural or innate power of thinking

(8B:357–58). They are the latent structure of our intellect, which becomes manifest through thinking.

The next three paragraphs contain three steps that move from recognizing the integrity and cognitive unity of various ideas, to finding grounds for the reality and truth of the ideas, to asserting a correspondence between such ideas and possible or actual things in the world. Descartes wants the meditator to discover that her innate ideas reveal the natures of things and the inherent necessity of God's existence. These passages are at the heart of his rationalist epistemology of metaphysical knowledge.

In the first paragraph, the meditator concludes that the ideas of extension reveal the "true and immutable natures" of things, whether these things exist outside her or not (7:64). Her initial evidence is that the ideas don't depend on her own will. Or rather, since the ideas can be "thought of at will" (7:64), it is their content that is not invented by her. Proof for this point arises from contemplating the "nature, essence, or form of the triangle":

> various properties can be demonstrated of the triangle – for example that its three angles equal two right angles, that its greatest side subtends its greatest angle, and the like – which properties I now clearly recognize whether I want to or not, even if before now I never thought of them at all when I imagined the triangle. Accordingly, these properties would not have been invented by me.
>
> (7:64)

Various properties can be "read from" the idea of a triangle with the clarity of demonstrative knowledge. These properties are *discoveries* of what is contained in or follows from the idea of the triangle and are not *inventions* of the meditator's own mind. Her idea is fixed; while clearly perceiving the triangle, she cannot will to add or subtract properties, such as holding that its angles are not equal to two right angles (7:117–18; see also 7:225). Through clear and distinct perception, the triangle's properties, including some previously unknown, become manifest to her, whether she wills so or not. They do not simply fill her experience, as the sensory ideas of the heat of a fire might (whether she wants to feel the heat or not), but (if she is attentive) they compel

cognitive acknowledgment. Of course, one might also draw new implications from obscure ideas; for example, from the resemblance thesis, one might newly infer that every shade of color, even one not yet experienced, resembles a real quality in an object. This is a formally valid argument, but the inferred claim is not true, because the resemblance thesis itself is false. By contrast, from the clarity with which she perceives the properties of the triangle, the meditator can recognize that she is contemplating a true idea, or a true and immutable nature.

In the second of the three paragraphs, Descartes considers whether this idea of a triangle could be gleaned from sensory experience of triangular bodies (as in Aristotelian abstraction of an essence or common nature). The meditator rejects this possibility. The evidence is again her ability to demonstrate various properties concerning "countless other shapes, of which there can be no suspicion that they ever came to me through the senses" (7:64). However, although she takes this ability as evidence that these ideas of shape are innate, an Aristotelian might instead appeal to the power of abstraction and contend that we generalize from instances of sensory shapes to the idealized shapes of geometry. Throughout the history of philosophy, there has been a more general debate between abstractionist and innatist accounts of geometrical knowledge, which recurs in the Objections and Replies. Gassendi (as a new empiricist) formulates an abstractionist position (7:320–21), to which Descartes responds (7:381–82). And in the Sixth Meditation, Descartes offers introspective evidence for nonsensory ideas of geometrical figures (7:72–73).

From her mental perception of geometrical properties of shapes, the meditator draws a strong conclusion:

> All these properties are surely true, since they are clearly cognized by me, and therefore they are something, and not merely nothing – for it is obvious that whatever is true is something, and I have already amply demonstrated that everything which I cognize clearly is true. And even if I had not demonstrated this, the nature of my mind is certainly such that I cannot but assent to these things, at least so long as I clearly perceive them.
>
> (7:65*)

In the first sentence, Descartes argues from the meditator's "cognizing clearly" some properties, to their being true, to their being something and not nothing. The triangle she considers is a fixed intellectual content, as found within the structure of thought prior to any judgment. The second sentence invokes the criterion we have found for clarity and distinctness, namely, compulsion of assent in a judgment: "the nature of my mind is certainly such that I cannot but assent to these things."

But what is assented to? The existence of material things is still in doubt. So the truth here concerns the essences of triangles and other geometrical figures whether they exist in bodies or not. These essences are themselves taken to be "something," inasmuch as they are clearly understood. Further, these clearly perceived truths do concern material things, as indicated by the title of the Meditation and its final sentence, invoking knowledge of "that corporeal nature which is the subject matter of pure mathematics" (7:71). These truths define the essence of a matter that, in the meditator's current epistemic situation, is considered as merely possible. Still, on this view, if matter exists it either *must* have these properties (in the case of extension itself) or *can* have them (in the case of various shapes and so on).

Descartes' claim to know the essence of matter prior to its existence is, then, a claim to know the possible properties of things (Med. 6, 7:71). The metaphysics of such possibility is complex. Descartes, like many of his contemporaries, made such possibility depend on the creative power of God. However, his theory is complicated by his special claim that the eternal truths of geometry are God's free creations (7:380, 432, 435–36; discussed in Ch. 9). For now, let us suppose that the knowledge of geometrical essences in the Meditation concerns eternal truths as actually laid down by God, which determine the real possibilities of the world of created matter, a world that God has in fact created.

In the third of the three paragraphs, Descartes offers his first statement of what later was called the "ontological argument" for the existence of God. In introducing the argument, he states the core principle of his metaphysical epistemology. The meditator asks:

> Now if from this alone, that I can produce from my thought the idea of something, it follows that everything that I clearly and distinctly perceive to belong to that thing really does belong to it, can this not yield a further argument to prove the existence of God?
>
> (7:65)

The ontological argument will be taken up shortly. For now, consider the strong claim made here concerning the relation between ideas in the human mind and the properties of things. The fact that the meditator has a clear and distinct idea of a thing's properties entails that the thing has those properties. If she clearly and distinctly perceives that the radii of a circle are all equal, or that the squares constructed on the sides of a right-angled triangle follow the Pythagorean theorem, then these properties are true of all circles and all right-angled triangles. Not all ideas, including complex and obscure ideas (such as the resemblance thesis, joining the idea of real quality to that of color) are true in this way. But what the human mind clearly and distinctly perceives as belonging to a thing does truly belong to it. (The claim is that what is so perceived belongs *to the thing*, and not merely to the idea of the thing.)

Descartes' discussion confers a special status on purely intellectual ideas latent in the human intellect. These are innate ideas that the mind has independently of the existence of the things in question (such as circles or triangles). His claim is very strong, because there is no reason to assume that, in general, just because an idea is innate it is true. There is nothing incoherent about a mind possessing innate ideas that are false or inaccurate, or that yield "material for error" (as with materially false ideas [7:43–44] that arise from innate sensory capacities [8B:359]).

To illustrate, let us step outside the *Meditations* and consider Descartes' claims about geometry and the essence of matter. He believed that geometrical essences found innately in human thought reveal what spatial properties matter can have. Let us grant that the mind innately has such ideas, which are ideas of Euclidean structures (i.e., structures as described in Euclid's geometry). With hindsight, we know that they do not impose a necessary structure on matter or space. We now know that the

structure of physical space is not accurately described by Euclid's geometry on a cosmic scale or a microscopic scale; non-Euclidean geometries are needed. Even if the human mind innately represented spatial structures as Euclidean, that would not prove that physical space has that structure. The mere innateness of an idea does not establish its truth.

As Descartes observes, human thought in itself "imposes no necessity on things" (7:66). And yet he has asserted that the mind's innate ideas tell him (and the meditator) what the world can be and is like, what properties things can and do have. Why should ideas in the human mind correspond to, or accurately represent, the actual or possible properties of mind-independent things? Thus far, he is relying on clarity and distinctness as the mark of truth. But we can raise again the question of how this mark is known to be a reliable guide to truth.

His answer depends on whether he invokes a divine guarantee. He might appeal to God for strong validation of the correspondence between human ideas and the true and immutable natures of things; or perhaps he sees no need for strong validation but accepts a presumption of accuracy for (clear and distinct) intellectual ideas. Either way, his claim is bold: that the innate structure of the human mind yields a stock of ideas that reveal the essences of things.

ONTOLOGICAL ARGUMENT (7:65–68)

Descartes' presentation of the ontological argument begins as follows:

> Surely I find the idea of God, or of a supremely perfect being, within me no less than I do the idea of any shape or number. And my understanding that it belongs to his nature that he always exists is no less clear and distinct than is the case when I demonstrate of any shape or number that something belongs to its nature. And therefore even if it turned out that not everything on which I have meditated in these past days is true, I should maintain the existence of God with at least the same degree of certainty as I have hitherto attributed to the truths of mathematics.
>
> (7:65–66)

The meditator clearly and distinctly understands that existence belongs to God's nature, and this understanding is offered as proof of God's existence. In this presentation, the proof is over quickly. The passage then repeats a fallback methodological position, equating the certainty here with that usually ascribed to mathematics, and the ensuing text examines the matter further, to remove an initial "appearance" that the argument is a sophism.

The remainder of the Meditation is divided about equally between discussion of the ontological proof and methodological reflections arising from it. The full force of the proof is developed by responding to various objections to the brief version just stated (7:66–68), a process that continues in the Replies.

One might ask why Descartes offered a second proof for God's existence, of a different sort, here in Meditation 5. To Caterus, he remarked that "there are only two ways of proving the existence of God, one by means of effects, and the other by means of his nature or essence," and he wanted to cover both (7:120). To Burman (5:153), he explained that the order – from effects first, then from the idea alone – follows the order of discovery (as in the analytic method). This second explanation fits the case. As its initial statement exhibits (and as he claims in the Geometrical Arguments [7:163–64]), he believed that this proof can be distilled into a single, self-evident intuition – a distillation that has been aided by the meditator's contemplation of herself and God in Meditations 2–4. This new argument exhibits the method by which Descartes purports to discover the essences of matter and mind and the mind–body distinction: purely intellectual intuition of essences. Accordingly, his defense of the ontological argument is followed by methodological discussion to secure clear and distinct perception as the means for knowing the natures of things (7:71).

ONTOLOGICAL ARGUMENT DEFENDED

The "ontological argument" is so-named because it proves God's existence by considering his "essence" or the necessary properties of his "being." The Greek root *ontos* simply means "being." The Latin form is *esse*, from which the word "essence" derives. Thus a

thing's "essence" is the "what it is" of the thing, that is, those properties that are inseparable from its being. The core of any ontological argument is the allegedly necessary connection between God's essence and existence. The original argument is attributed to the eleventh-century Benedictine monk, Anselm of Canterbury. Various versions of this argument (and objections to them) were well known in Descartes' day (although not as the "ontological argument," a name due to Kant). This type of argument contrasts with a cosmological argument, that God must be posited as cause for the existence of finite or contingent beings in the world. The Third Meditation arguments from "effects" are cosmological arguments.

Descartes' first presentation, quoted above, distills the argument into the single insight that "it belongs to [God's] nature that he always exists" (7:65). Existence is a property inseparable from God, that is, from a "supremely perfect being." Thus baldly stated, the argument has the form of contemplating one's idea of God and finding that it presents the necessary existence of the deity. As with the ideas of geometrical objects, it may here be a case of bringing the meditator to notice something in the idea of God that she hadn't noticed before. Still, the bare statement of that presumed insight may not immediately overwhelm the meditator. So Descartes elaborates the argument by having her consider three objections.

She first considers an objection arising from a standard position among scholastic Aristotelians: that existence is separable from essence, so that questions about them must be answered separately (7:66). (While Aristotelians routinely held that knowledge of essences depends on knowledge of existing things, they also held that the question of whether a thing exists is distinct from the question of what that thing is, or its essence.) The meditator has already found a distinction between essence and existence in her ideas of geometrical objects, for she was able to suppose that actual existence is not essential to such objects (7:64). If actual existence is always separable from essence, then God's existence cannot follow from his essence.

This objection is addressed through a careful consideration of the idea of God:

> But when one attends more carefully, it is evident that existence can no more be separated from the essence of God than we can separate from the essence of a triangle that the magnitude of its three angles equals two right angles, or than we can separate the idea of a mountain from the idea of a valley. Hence it is just as much of a contradiction to think of God (that is, a supremely perfect being) lacking existence (that is, lacking a perfection) as it is to think of a mountain without a valley.
>
> (7:66)

In effect, Descartes directs the meditator to consider closely her idea of God, and he describes the expected result: that it presents existence as an intrinsic property of God. The parenthetical remarks expand on the original argument by repeating that God is a supremely perfect being and noting (or claiming) that existence is a perfection. Both of these claims will subsequently be challenged. But, in this first response, Descartes has extended the argument by connecting existence to God's essence through the notion of perfection. A being that did not exist would lack a perfection (viz., existence), but God is supremely perfect, hence he must have that perfection. Or so the idea of God allegedly reveals.

Assuming that the meditator has reached the desired insight, Descartes' second objection questions the significance of this result. Even if existence is inseparably bound up with God's essence in the meditator's idea, surely her thought "imposes no necessity on things" (7:66). Hence, real existence cannot be concluded from the idea: "it does not seem to follow from the fact that I think of God as existing that he does exist." Indeed, "just as I may imagine a winged horse even though no horse has wings, so I may be able to attach existence to God even though no God exists" (7:66). There are apparently two stages to this objection.

The objection first asks whether it would follow simply from the fact that the meditator thinks of God as necessarily existing that he must exist. Second, the continuation suggests what is behind this objection. If the connection between the essence and existence of God in the meditator's idea were a mere construct or a fictitious composite, like imagining wings on a horse, the idea would have no bearing on reality.

Descartes' response concedes that mere human thought could not entail the existence of God, and then denies that the meditator is dealing merely with her own composite idea:

> From the fact that I cannot think of a mountain without a valley, it does not follow that a mountain and valley exist anywhere, but simply that a mountain and a valley, whether they exist or not, are mutually inseparable. But from the fact that I cannot think of God except as existing, it does follow that existence is inseparable from God, and hence that he does really exist. It is not that my thought makes it so, or imposes any necessity on any thing; but, on the contrary, it is the necessity of the thing itself, namely the existence of God, that determines my thinking in this respect. For I am not free to think of God without existence (that is, a supremely perfect being without a supreme perfection) as I am free to imagine a horse with or without wings.
>
> (7:66–67)

This response answers both stages of the objection at once (or else conflates them). The meditator is to determine that she is perceiving a true and immutable nature by examining whether she can separate existence from God. Descartes here again appeals to the principle, suggested in the Third Meditation (7:51), that fictitiously invented connections are subject to the meditator's will. What she has arbitrarily joined, she can put asunder, as with the horse and wings. (In fact, the lack of necessary connection might be illustrated using any contingent connection, such as between a horse and its harness, but Descartes is focused on an objection that the idea of God is like a fictitious invention.) What has an intrinsic connection will resist all efforts to resolve the ideational connection and therefore is conjoined by necessity. She finds that the connection between God's essence and existence cannot be sundered. Nor, indeed, can the connection between mountain and valley (assuming that "valley" here means the downslope of a mountain – an example of a presumably empirically obtained idea of a contingently existing object that nonetheless exhibits an essence, but one not including existence). Both are therefore cognized as necessary. This necessity is not, Descartes maintains, imposed

by the meditator but is discovered in God as the object of her clear and distinct idea.

The third objection questions whether this alleged necessity should be recognized as a special form of "hypothetical necessity." With a hypothetical necessity, one makes a supposition, say, that all triangles are right-angled triangles, from which it would then follow that all triangles are subject to the Pythagorean theorem (which holds only for right-angled triangles). The conclusion, that all triangles are Pythagorean, follows necessarily given the hypothesis that all triangles are right-angled. But in fact not all triangles are right-angled. The supposition is not true and so certainly not necessarily true. Truly necessary connections cannot be established through mere supposition or hypothesis.

The text of this third objection runs as follows:

> while it is indeed necessary for me to suppose God exists, once I have made the supposition that he has all perfections (since existence is one of the perfections), still, this prior supposition was not necessary.
>
> (7:67)

Perhaps the meditator's idea is merely a hypothetical construction. Given the supposition that God has all perfections, including existence, it would necessarily follow that God exists. But, according to the objection, there are no grounds for believing that the supposition is true and so none for believing that God's existence is unrestrictedly necessary.

In response, Descartes again directs the meditator to her innate idea of God, which (she should find) necessarily attributes all perfections to God, not by supposition but intrinsically.

> For although it is not necessary that I ever light upon any thought of God, whenever I do choose to think of the first and supreme being, and as it were bring forth the idea of God from the treasure house of my mind, it is necessary that I attribute all perfections to him, even if I do not at that time enumerate them all or attend to them individually.
>
> (7:67)

The intrinsic content of the idea of God necessarily attributes all perfections to him. It contrasts with fictitious ideas, such as that all triangles are right-angled, or, in Descartes' own example, that all quadrilaterals can be inscribed within a circle (when some cannot). Such fictitious ideas can enter into hypothetical necessities, but these hypothetical connections contain no inner necessity. By contrast, the idea of God has this inner necessity, of the same sort that obtains between a triangle and the property of having three angles.

Thus far, Descartes has not moved beyond his response to the second objection, in which he also (in effect) claimed that the idea of God is not a fictitious invention. But he goes on to add something new. He further claims that the idea of God has the mark of a "true idea" and is "an image of a true and immutable nature" (7:68). The mark of a true idea is clear and distinct perception, in this case of the necessary connection between God's essence and his existence. As in the previous discussion of the essence of matter, clear and distinct perception of a necessary connection is taken as evidence for its truth.

When all is said and done, there remains the question (broached in the second objection, above) of how the human idea of God can be known to reveal the essence of a mind-independent reality. Thus far, Descartes has rested this part of the argument on two claims: first, the meditator's clear and distinct perception that the idea of God includes necessary existence for God; and, second, her conclusion that, because this connection is not subject to her will, the idea is not fictitious but is the perceiving of a true and immutable nature – a discovery that also relies on clear and distinct perception.

If the argument relies on clear and distinct perception, what role, if any, does the presumed innateness of the idea play? The quick answer is that neither Descartes nor his Aristotelian (or generally empiricist) opponents could conceive of a clear and distinct idea of God that arose from the senses. God, it was agreed, is an immaterial being, hence not spatial and so not perceivable through the senses. Although painters may show God as a white-haired man, such images, being spatial, in no way depict the infinite, immaterial being of God.

A more extended answer would observe that the innate ideas discussed in the Fifth Meditation are intellectual ideas and that the human intellect is an instrument of truth. Descartes takes up this deeper connection between truth and the intellect in the immediately subsequent methodological reflections.

FURTHER OBJECTIONS AND REPLIES

Before turning to those reflections, let us consider some discussions of the ontological argument in the Objections and Replies.

Gassendi raised several objections concerning essence and existence. For starters, he refused to acknowledge that essence and existence can be separated. He reasoned that if a thing doesn't exist, it has no essence either, since essences can't exist apart from their instances (7:319–20, 324). (In fact, he considered notions of essence to be mere empirical generalizations from similarities among things [7:320–21].) Hence, he rejected Descartes' claim that actual existence pertains to some essences but not others. This objection reflects disagreement over the very notion that essences or natures have any reality at all (even objective reality) apart from existing things, which is part of a larger disagreement over innate ideas and the intellect's ability to operate independently of the senses, not peculiar to the ontological argument.

The most famous of Gassendi's objections is his assertion that existence is not a predicate that can be differently related to God and to other things. Either existence isn't a predicate, or it is equally contained in the conceptions of all things (7:322–23). This point is interspersed with other arguments, but, if isolated, it says that all things, when thought of, are thought of as existing. He grants that we can't think of a winged horse without wings or a mountain without a downslope, just as we can't think of God not having knowledge and power. But, he claims, existence is no different. Existence cannot be a perfection present or absent in the essence of a non-existent thing, since what doesn't exist has no perfections; all existing things therefore share equally the perfection of existence. Hence, God, if he exists, doesn't differ from other things on this score (7:323). Gassendi contends that Descartes cannot "explain how it is possible that we can think of

a sloping mountain or a winged horse without thinking of them as existing, but cannot think of a wise and powerful God without thinking of him as existing" (7:324).

One way to interpret this point is that any representation of a thing represents it as it would be if it did exist. In representing mountains or winged horses, there is nothing we add to or subtract from the representation in thinking of them as existing. Hence, in the cases of God, a mountain, and a winged horse, our bare ideas represent them as existing. But if this is true of all ideas, it is not peculiar to the idea of God; and since we don't infer from merely thinking of them that a specific triangle or a winged horse exist, we should not infer from our idea of God that he exists. Stated in this way, Gassendi's point is similar to Hume's and Kant's later objections that existence is not a predicate or property. Effectively, they say that imagining a thing as existing is no different from simply imagining a thing: the thing "looks the same" in both cases. Therefore, thinking of the thing as existing adds nothing to it; hence existence is not a predicate or property. To imagine a thing is to imagine it as existing.

Now, in fact, Descartes granted Gassendi's (and so Hume's and Kant's) point that when we imagine things we imagine them as existing, but he disagreed with their conclusion. Descartes, unlike Gassendi (in the Objections), held that thought cannot be reduced to images. Thought can grasp abstract relations and properties, including possibility and necessity, which can therefore enter into the content of a judgment. In the case of existence, he claimed that we are able to understand the difference between a thing with merely possible existence and one that exists necessarily. In both cases, in thinking of the thing we would think of it as it would be if existing. But in the one case (say, a geometrical figure) we recognize it as a merely possible existent, whereas in the case of God we cognize his existence as necessary.

Here is how he put the point in the First Replies:

> It must be noted that possible existence is contained in the concept or idea of everything that we clearly and distinctly understand, but that necessary existence is contained only in the idea of God. Those who carefully attend to this difference between the idea of God and

> every other idea will undoubtedly perceive that even though we always understand other things as if they were existing, still, it does not follow that they do exist, but merely that they are capable of existing. (7:116–17)

He allows that our ideas represent things as existing but denies that Gassendi has fully described the content of the various thoughts involved (7:383). According to Descartes, the content can include different relations between the thing represented in thought and its existence: its existence can be perceived as merely possible (a thing like this can exist) or as necessary (this thing must exist and so does exist). In both cases, the thing is thought of as an existent thing, but under different modalities: possibility as opposed to necessity.

There is another way to understand Gassendi's (and Kant's) objection, which is that existence is not a property that the concept of a thing may or may not have, but is the positing of a thing in the world that corresponds to the concept. The concept remains the same whether the thing exists or not, or perhaps the concept can only convey something about the thing, on the assumption that the thing exists. Hence, Descartes would be begging the question by assuming that that the thing in question exists. Descartes' answer would be the same as to his own second objection: his idea of God is not just an idea of God's necessity, but a perception of the real necessity of God's existence (see 7:149–50). It has the marks of a true idea. Hence, its content obtains: God exists.

We are not in a position here to settle this dispute between Descartes and Gassendi. It turns on the issue (to which we shall return) of innate ideas and the notion that the intellect can reveal to us the real possibilities and necessities of things, independently of sensory experience.

In the First Objections, Caterus repeated parts of Aquinas' discussion of Anselm's original argument, which Aquinas discussed in order to set aside. Here is how Aquinas stated that argument (Caterus quotes Aquinas, *Summa Theologica*, Pt. 1, qu. 2, art. 1):

> As soon as we understand what the word "God" means, we accept that God exists. For the word "God" means that than which nothing

> greater can be signified. But that which exists in reality as well as in the intellect is greater than that which exists in the intellect alone. Hence, since God immediately exists in the intellect as soon as we have understood the word "God," it follows that he also exists in reality.
>
> (7:98)

This is a well-known version of the ontological argument. Aquinas denies its force:

> Let it be granted that we understand the word "God" to mean what has been said, that is, that than which nothing greater can be thought. However, from this it does not follow that we understand that what is signified by this word exists in the real world, but only that it exists in the apprehension of the intellect. Nor can it be shown that this being exists in reality, unless it is conceded that there really is something than which nothing greater can be thought; but this is not granted by those who hold that God does not exist.
>
> (7:99)

Aquinas and Caterus both accept that the mere meaning of a human word, or a concept constructed with that meaning, does not reveal the true nature of God and so cannot be used to prove his existence. Indeed, Caterus had previously paraphrased Aquinas' conclusion (from the same text) that, in general, God "is not known in terms of the precise concept of his own being" (7:97). Caterus and Aquinas agree that the existence of God can be proven only through effects, and that the human mind does not properly understand God's essence.

In reply, Descartes agrees that we cannot prove the existence of God by contemplating the meaning of a word, a meaning that presumably would be acquired from others through the senses by listening or reading. As he puts it: "because a word conveys something, that thing is not therefore shown to be true" (7:115). But, he rightly claims, his own argument is not based on words or on concepts constructed to match linguistic usage (see also 7:31–32). He reprises his argument as initially given in the Fifth Meditation:

> Whatever we clearly understand to belong to the true and immutable nature, or essence, or form of something, can truly be asserted of that thing. But once we have made a sufficiently careful investigation of what God is, we clearly and distinctly understand that it belongs to his true and immutable nature to exist. Therefore we can now truly assert of God that he does exist.
>
> (7:115–16)

Descartes is not concerned with what has been said about God or with how he may be conceived in human tradition. Rather, he claims to find in his mind an idea of God that constitutes a clear and distinct perception of the essence of God. This idea is a knowing of God through his essence as necessarily existing. As Descartes explains elsewhere, this idea is suited to a finite intellect; without fully "grasping" God's essence, it permits one to "understand," "reach" in thought, or "know" God's essence or infinite being (7:365, 7:52, 1:152), which reveals that he must exist.

In framing his own objection, Caterus did not stress the meaning of the word "God," as Aquinas had, but the human "concept" of God, which, he contends, may not be informative about "anything actual in the real world" (7:99). Descartes takes him to be concerned about potential objections that he had raised in the Fifth Meditation, regarding the relation between essence and existence, the informativeness of human ideas about extramental reality, and whether the idea of God might be a cobbled-together fiction. In reply, he again appeals to the unity and integrity of his perception of God's true and immutable nature (7:116–17), a sign that this idea does inform us of things as they are in themselves. His perception of necessary existence in his idea of God is not about a feature of his idea but is a perception of God's very essence and hence being.

We are thus brought back to the fundamental principle of Descartes' metaphysical epistemology: that the innate ideas of the human intellect, insofar as they provide clear and distinct perceptions, are true perceivings of the nature of extramental reality. And we are still looking for a satisfactory demonstration that this is so.

CLEAR AND DISTINCT PERCEPTION AS SOLE METHOD FOUND (7:68–69)

At the end of the ontological argument, Descartes makes a sweeping methodological pronouncement:

> whatever manner of proof I use, it always comes down to this: that only what I clearly and distinctly perceive fully convinces me. And although some of the things that I so perceive are obvious to everyone, others in fact are discovered only by those who look more closely and investigate more carefully; but once they have been discovered, the latter are deemed just as certain as the former.
>
> (7:68)

This statement emphasizes the "conviction" and "certainty" that comes from clear and distinct perception but so far does not mention truth; but Descartes immediately reasserts the truth of such perceptions in discussing God's role in banishing the doubt. The quotation also offers an important methodological hint for the reader undergoing (or not undergoing) the epistemological conversion experience of the *Meditations*. It says that truths which are not immediately obvious can become so upon more careful investigation. Belief in the Pythagorean theorem results from such investigation, but once the theorem is seen, it is believed "just as strongly" (7:69) as simpler mathematical results. Finally, Descartes claims that the ontological argument possesses this same clarity, even if at first obscured by preconceived opinions (7:69).

The comparison of the ontological argument with the proofs of geometry has been a theme of the Fifth Meditation. As invoked here, it reminds the reader of the need to turn away from "preconceived opinions" and "the images of things perceived by the senses" (7:69) in order to comprehend the argument. Earlier, the comparison (7:65–66) supported the ontological argument by equating its perceived certainty at least with that of mathematics – which, prior to the *Meditations*, the meditator had accepted as "the most certain truths of all" (7:65).

How does the relation between the ontological argument and the proofs of geometry work? Suppose the meditator is prepared

at this juncture to grant mathematics its own cognitive force. If the ontological argument reaches the same standard of conviction, then the meditator ought to grant it the same force. Descartes would gain her agreement that the proofs of mathematics and metaphysics have the same cognitive footing. On the surface, at least, this strategy avoids the nagging problem of the circle, by deriving the cognitive legitimacy of a proof for God's existence from the comparison with mathematics, without needing divine validation.

We return to this strategy in discussing the circle. Descartes, however, takes the opposite tack and argues that even the truths of mathematics cannot be known without first knowing that God exists.

KNOWLEDGE OF GOD NEEDED TO BANISH DOUBT (7:69–71)

Despite recent reminders of the certainty granted to mathematics, Descartes now contends that all knowledge, even of geometry, depends on God (7:69). We may be convinced by geometrical demonstrations while attending to them (they "compel our assent," as in Med. 4), but when not attending to them we can recall arguments (as in Med. 1) that provide general reasons for doubting our cognitive faculties. These general doubts undermine confidence even in the demonstrations of geometry, when we are not closely considering those demonstrations.

One might think it sufficient for saying we "know" geometrical truths that we understand and assent to geometrical demonstrations when presented with them. But Descartes claims that, without first knowing that God exists and is no deceiver, unresolved general doubts undermine our geometrical knowledge even if we can correctly construct every proof in Euclid.

Accordingly, atheists can't know geometry. As Descartes explains in the Second Replies, an atheist may perfectly "cognize" the Pythagorean theorem (7:141*), but he can't know it. Descartes' argument can be clarified by considering his conception of knowledge. In the First Meditation, he spoke of seeking something in the sciences "that was firm and lasting" (7:17). In the Fifth

Meditation, he argues that without a knowledge of God, we would "never have true and certain knowledge about anything, but only shifting and changeable opinions" (7:69). Anyone who lacks knowledge of God is subject to skeptical challenges. If these can dislodge his opinion, he fails to have knowledge: "no act of cognition that can be rendered doubtful seems fit to be called knowledge" (7:141*).

The basic form of Descartes' argument is clear. He presents a conception of knowledge according to which the thing known must be true, must be accepted for good reasons, and must not be subject to known objections. He then suggests that, prior to recognizing that God exists and is no deceiver, we can undermine even our knowledge of geometry by raising skeptical doubts about the general reliability of our cognition. Once God's existence and perfection have been proved, we can remove the doubts, and now the good reasons we have for believing geometrical demonstrations (that we clearly and distinctly perceive them) remain a firm and lasting basis for knowledge.

GOD AND THE CIRCLE

The fact that Descartes appeals to clear and distinct perception to prove the existence of God (7:69) and then appeals to God to support the truth of clear and distinct perception (7:69–70) resulted in Arnauld's charge of circularity (7:214). In Chapter 5, we considered the "remove the doubt" and "presumption in favor of the intellect" strategies for avoiding the circle, as opposed to a "strong validation of reason" strategy, which seemed to make the circle inevitable. Now we should ask whether, in the Fifth Meditation, Descartes appeals to God's existence and perfection merely to remove the doubt or instead for direct validation of the intellect (as seemed the case in Med. 4). If the former, then the sense in which all knowledge "depends on God" would be comparatively weak: having investigated the deceiving-God hypothesis and found it wanting, the doubt is removed, leaving us with our presumptively true clear and distinct perceptions. If the validation strategy is in play, then the sense in which all knowledge "depends on God" would be quite strong: we would need

knowledge of God's existence and perfection to have reason to trust the truth of our clear and distinct perceptions.

The question of which strategy fits the text of the Fifth Meditation depends in part on what sort of challenge to the intellect Descartes intended to address there. If he was simply responding to the "slight" and "metaphysical" doubt raised by the "long-standing opinion" that there is an all-powerful God who might be a deceiver, then the remove-the-doubt strategy (as paired with presumption) appears to avoid circularity. His comparisons of the ontological argument with geometrical demonstration aid the presumption reading. In the Meditation, these comparisons initially seemed to provide a fallback position. That is, Descartes would be saying that even if the arguments of Meditations 3 and 4 about God and deception fail, the ontological argument still achieves the same cognitive force as geometrical demonstration. And if the meditator is presuming that the transparent perceptions of the intellect are true, then these comparisons support the truth of the ontological argument by putting it in a class with mathematical knowledge. (The question would remain of whether the argument merits the comparison.)

However, there is a fly in the ointment. Another ground for doubt is in play besides the deceiving-God hypothesis. This is the defective-origins proposal from the First Meditation (a version of the defective-design hypothesis). This challenge surely cannot be removed simply by appealing to clear and distinct perception to prove that God exists and is no deceiver, for it begins from the assumption that there is no God and that the human intellect is therefore the product of chance causes and may be naturally defective. Let us consider whether there is any way to answer this challenge without begging the question or arguing in a circle.

DEFECTIVE ORIGINS

In the latter part of the Fifth Meditation, Descartes presents two grounds for doubt about such evident matters as the geometrical demonstration that the three angles of a triangle equal two right angles:

> as soon as I turn my mind's eye away from the demonstration, then in spite of still remembering that I perceived it very clearly, I can easily fall into doubt about its truth, if I am in fact ignorant of God. For I can convince myself that I have been made by nature so as to go wrong from time to time in matters that I think I perceive as evidently as can be – especially when I remember that there have been frequent cases where I have taken things as true and certain but later have been led by other arguments to judge them to be false.
>
> (7:70*)

The meditator dismisses the second ground, concerning things accepted as true and later judged to be false, citing her previous ignorance of the truth rule, so that she "believed these things for other reasons that I later discovered to be less firm" (7:70). Prior to undergoing the process recorded thus far in the Meditations, the meditator (as, earlier in life, Descartes himself) did not know how to recognize clear and distinct perceptions and so accepted her beliefs on some other basis (such as sensory experience or the authority of a teacher).

The first ground, that she has "been made by nature so as to go wrong" in (at least some cases of) clear and distinct perception offers the real challenge, by reinvoking the defective-origins hypothesis. It is this ground, and not the deceiving-God hypothesis (ostensibly already removed in Meds. 3–4), that the meditator now purports to banish through her knowledge that God exists.

> However, after I have perceived that God exists, since at the same time I understood that everything else depends on him and that he is no deceiver, I consequently gathered from this that everything that I clearly and distinctly perceive is of necessity true. Accordingly, even if I am no longer attending to the arguments that led me to judge that this is true, as long as I remember that I clearly and distinctly perceived it, no counterarguments can be adduced to make me doubt it, but rather I have true and certain knowledge of it.
>
> (7:70)

God's existence by itself would not counter the defective-origins hypothesis. Two further considerations are needed: God's perfection

(entailing nondeception) and the fact that, as the passage says, "everything else depends on him." Descartes here reprises a line of thought from the Fourth Meditation. Our clear and distinct perceptions are true because God made us, and in particular, he made our intellect (and will), and he would be a deceiver if clear and distinct perceptions, to which we must assent, were ever false. God's creation of our cognitive faculties provides strong validation for those faculties.

The defective-origins hypothesis concerns the origin of the meditator's cognitive faculties: have they been fashioned by chance developments in a godless universe, or have they been created (hence designed) by God? According to the Fourth Meditation, they have been designed by a nondeceiving God. But a familiar problem arises. Our only reason for believing that God exists and created our minds is that we clearly and distinctly perceive it to be the case. And the defective-origins hypothesis challenges the reliability of such perception. Either the question is begged or the circle closes again.

Let us consider the situation more fully to see if there is a way out. The meditator might evaluate the defective-origins hypothesis by comparing the competing explanations for the origin of her intellect. If she had to prove one of the explanations before proceeding, she would indeed be stuck in a circle. But suppose that she actually considered the defective-origins hypothesis to offer an even more "slight" and "metaphysical" ground for doubt than the deceiving-God hypothesis. She might think that the basic presumption in favor of the intellect entitles her to use her intellectual faculty in evaluating the (so far ungrounded) possibility of defective origins. Or she might appeal to the extraction argument (reviewed in Ch. 5) in support of clear and distinct perception. She would then use her intellect to find the best explanation of the origin of her intellectual faculty. In the course of Meditations 3–5, she has (allegedly) found three good arguments for the existence of God and one for his nondeceptiveness. The defective-origins hypothesis is merely speculative; in fact, she cannot conceive that a conscious human mind could arise from chance conglomerations of matter. Hence, she accepts the creation hypothesis as the best explanation for the origin of her cognitive faculties.

Descartes would have considered the defective-origins hypothesis to be comparatively weak. In his day, there was disagreement over whether a purely material being could have sensation and thought. Although Descartes himself allowed that animal bodies (including the human body) might develop through chance interactions of matter, unguided by a creator, few believed that a *thinking being* could so develop. Descartes included this hypothesis among those considered to be "hyperbolical" (7:226) and hence implausible (those doubts depending on ignorance of God, including both branches of the defective-design argument). Of course, to be effective, he must not simply reflect current opinion but offer a reasonable assessment of the possibility of this happening. In his philosophy, Descartes considered it impossible (a conceptual contradiction) that matter could think (7:444). Today, we conjecture that consciousness and thought can evolve by natural processes (although the explanation is not complete). We are unlikely to deem Descartes' creationist hypothesis to be stronger than the alternative.

Even by Descartes' own lights, for his creationist hypothesis to rule out alternatives, the metaphysical method of intellectual perception must establish some strong conclusions: that God exists, is no deceiver, and is the creator of the human mind. Suppose that, avoiding initial claims about God or creation, Descartes appealed first to the extraction argument in support of clear and distinct perception and then used that method to decide for creation over natural origins. Such a move avoids the circle but seems to beg the question about whether clear and distinct perception can be trusted. As we observed in Chapter 5, those perceptions must be used in assessing the extraction argument itself. Perhaps the extraction argument mistakenly overgeneralizes from the certainty of the *cogito*. If clear and distinct perception cannot already be trusted, how would we decide? A presumption in favor of the intellect fares no better; it also begs the question about whether the pure intellect reveals the real natures of things, and hence the existence and creative tendencies of God.

More generally, one need not embrace Descartes' defective-origins hypothesis to challenge whether the human mind can limn the essences of things and establish that God exists and has given us

intellects adequate for producing an *a priori* metaphysics. There are other naturalistic accounts of the origin of thought. One might conjecture that the human mind has arisen from nature and is not generally defective in design, but simply lacks the innate ideas or intellectual perceptions of God and matter that Descartes claims to find. Such a mind might acquire ideas of God and of the essence of matter, without having reason to believe that those ideas reveal the essences of things.

Such challenges to the existence or reliability of Descartes' intellectual perceptions move beyond the circle to address his system more generally. We return to them in Chapter 10.

THE CIRCLE AND THE AIM OF THE *MEDITATIONS*

An underlying question frames our consideration of the circle. This is the question of whether, in the *Meditations*, Descartes intended, or needed, to provide a deep challenge to the reliability of human cognition, or merely wanted to use the skeptical process to direct the reader to clear and distinct perceptions and then on to the first principles of metaphysics and physics. (This question was raised at the ends of Chs. 2 and 3.)

Evidence is found on both sides. Less than two years after the *Meditations* appeared, Descartes wrote to Princess Elisabeth that he has "never spent more than a few hours a day in the thoughts that occupy the imagination, and a few hours a year on those that occupy the intellect alone" (3:692–93) detached from imagination and sense. The connotation is that one should engage in metaphysics long enough to perceive the existence of God and the essences of mind and matter, and then move on to natural philosophy (having achieved a new understanding of the senses, as in Med. 6).

If Descartes' aim was simply to introduce the method and results of clear and distinct perception and get on with things, then talk of a presumption would be understandable. Descartes would indeed be out to discover some truth, not about the question of whether human minds can know truth, but about the main topics of metaphysics (God and finite beings). He wanted to help the reader see what good reasons for adopting a metaphysical

thesis are like, and then to direct her to some conclusions based on good reasons. He did not intend to pose some very deep question about whether the human mind is capable of truth at all. There is no circle, because he never intended to offer strong validation in the first place. It is interesting to note that, in the Geometrical Arguments, he did not attempt to validate clear and distinct perception but simply appealed to "self-evident" propositions and arguments (7:162–63).

In this connection, there is a further fallback position which, if not acceptable to Descartes, still preserves central aspects of his project. Suppose that Descartes' arguments for God's existence fail – for example, because readers do not find an idea of God's nature innately impressed upon their minds. There are still some "reasonable" (but not absolutely certain) beliefs that a Cartesian inquirer might accept. He might accept the reasonable belief in the external world acknowledged in the First Meditation and set aside in the quest for metaphysical certainties (7:22). Such an inquirer might pursue the sciences, using clear and distinct reasoning and careful observation to sort through empirical evidence. He would also accept the truths of mathematics, clearly and distinctly perceived, and he might hypothesize (without proving) that matter consists of extension and its modes. It might even seem reasonable that mind is distinct from matter, supposing he clearly perceives it as such. He cannot remove the deceiving-God and defective-origins hypotheses. Hence, his reasoning remains subject to "slight" and "metaphysical" doubt. But the inquirer might reconceive the standards of knowledge, so that genuine knowledge is compatible with having good reasons for a belief and only weak reasons to challenge it. Or the inquirer might decide that strong probability was a sufficient standard for belief.

On the other side, it seems that given his metaphysical ambitions, Descartes both should have wanted to, and did, pose deep questions about the relation between the human intellect and the real order of things. He was after all not out merely to achieve an "all things considered" best theory of the world. He was after the one true metaphysics.

Descartes knew the deeper challenge could be posed. In the Fourth Replies (quoted in Ch. 5), he considered the supposition

that "all things are constituted the same way in actual reality as they are in our perception" (7:226), and he suggested that this supposition can be accepted once the "hyperbolical doubts" of the First Meditation have been removed by finding that God exists and is no deceiver. But it is not clear that, once raised, the matter can be dispensed with so easily. Elsewhere, the second objectors (7:127) repeated Caterus' query (7:99) about whether our human concepts or ideas actually do reveal the real essences and existence of things, urging that God's existence depends on the real possibility of his essence, not on human concepts. In response, Descartes distinguished two sorts of possibility. The first coincides with "whatever does not conflict with our human concepts" (7:150); on this conception, our human concepts do inform us of the real possibilities of things. He offered this as the usual notion and gave a corresponding definition in the Geometrical Arguments (concerning concepts and things in general): "When we say that something is contained in the nature or concept of a thing, this is the same as if we had said that it is true of that thing or can be affirmed of that thing" (7:162). However, he was aware that the claim that human concepts reveal real possibilities (or, in the ontological argument, real actualities) might be challenged. The second objectors might be asking about a second sort of possibility, "that relates to the object itself" apart from human concepts (7:150); this would be a type of possibility to which human minds could have no access. Descartes refused to take this sort of challenge seriously, since otherwise "all human knowledge will be destroyed, though for no good reason" (7:151). Here, Descartes framed a deep challenge to whether our concepts match reality, only to put it aside. We may ask whether, given the goal of proving the one true metaphysics, he should have done so.

This second aim, of deeply challenging reason and providing deep foundations in response, is not incompatible with the first (methodological) aim, of helping the reader to uncover and use the faculty of pure intellect. But the first aim does not require the second. It can be evaluated on its own, by whether the reader finds the promised clarity. The first aim meshes nicely with the methodological bent of the early seventeenth century. The second aim engages more fully the metaphysical tradition. Previous

metaphysicians had attempted to explain how human cognition could achieve knowledge of essences – whether through Platonist apprehension of separate Forms, or the Aristotelian intellect, which distills forms or essences from sensory contact with things. Descartes' doctrine of the creation of the eternal truths offers its own explanation of how human concepts could (innately) be aligned with the very natures of things. Perhaps Descartes was caught between these two aims: of simply putting forward the best arguments he had for the first principles of his new science (something he could do without circularity, but with no guarantee of ultimate truth), and of offering an ultimate explanation for why his best arguments must reveal the one true theory (where his efforts appear question-begging or circular).

These various construals of Descartes' aims and strategy should help readers, as they ponder the relevant texts, to develop their own positions on the circle, which might be one of those described, some combination of them, or a further strategy. One of the intriguing features of philosophical texts is that they repay close study and interpretive work. The problems raised by the circle and Descartes' metaphysical method are worthy of ongoing scrutiny.

REFERENCES AND FURTHER READING

Standard commentaries all consider the topics of this Meditation. Secada explores Descartes on essences, innateness, matter, and proofs for the existence of God. His ch. 1 explicates the scholastic Aristotelian notion that existence precedes essence in the order of knowing.

Kenny, ch. 5, introduces Descartes on innate ideas. Flage and Bonnen, ch. 2, and Nelson, "Cartesian Innateness" (in Broughton and Carriero), relate innate ideas to Cartesian method, as also Hatfield, "Fleshless Eye," in A. Rorty.

The articles by Gaukroger and Marion in Cottingham, *Cambridge Companion*, consider Descartes on mathematics and matter's essence. Menn, ch. 8, sec. B, discusses the essence of matter. Normore examines "Descartes and the Metaphysics of Extension," in Broughton and Carriero, 271–87. Gaukroger (ed.), *Descartes:*

Philosophy, Mathematics and Physics (Brighton: Harvester, 1980), contains articles on Descartes' epistemology, mathematics, and physics. On Descartes' relation to Platonism (with additional references), see Tad Schmaltz, "Platonism and Descartes' View of Immutable Essences," *Archiv für Geschichte der Philosophie* 73 (1991), 129–70.

Descartes' claim that "the stars, the earth, and everything we observe in this visible world," including "plants" and "human beings," might arise by natural processes from a "primeval chaos" is in *Principles* III.45–47 (8A:100–103; see also 8A:203). (We must assume that he means the bodies of human beings, not their souls.) Lucretius, *On the Nature of the Universe*, trans. R. E. Lathan, rev. J. Goodwin (London: Penguin, 1994), 139, 148–49, describes a process by which plants and animals, including human beings, arise from chance combinations of matter, including spontaneous generation and subsequent selection of forms by their viability.

For more on Descartes' ontological argument, consult Kenny, ch. 7, B. Williams, ch. 5, Carriero, ch. 5, and Dicker, ch. 5. Lawrence Nolan, "The Ontological Argument as an Exercise in Cartesian Therapy," *Canadian Journal of Philosophy* 35 (2005), 521–62, has kinship with the present interpretation, as does Cunning, *Argument and Persuasion*, ch. 6. My interpretation focuses on argument "A" as denoted by Willis Doney, "Did Caterus Misunderstand Descartes's Ontological Proof?" in Voss, 75–84; I treat Descartes' subsequent discussion of perfection and existence as subsidiary.

J. Barnes, *The Ontological Argument* (London: Macmillan, 1972), analyzes the logical structure of such arguments. Alvin Plantinga (ed.), *The Ontological Argument: From St. Anselm to Contemporary Philosophers* (Garden City, N.Y.: Doubleday, 1965), provides an historical overview and selections from sources. G. R. Oppy, *Ontological Arguments and Belief in God* (Cambridge: Cambridge University Press, 1995), offers a taxonomy of versions of the argument. The passages that Caterus quotes are found in Pegis, *Introduction to Aquinas*.

References on the circle are at the end of Chapter 5.

8

THE NATURAL WORLD AND THE MIND–BODY RELATION

MEDITATION 6: THE EXISTENCE OF MATERIAL THINGS, AND THE REAL DISTINCTION BETWEEN MIND AND BODY

The Fifth Meditation began the meditator's return to the material world. Having disavowed matter and the senses in the First Meditation, in the Fifth she contemplated the essence of material things – turning away from sensory ideas toward her innate ideas of geometrical objects. Now in the Sixth (and longest) Meditation, she examines the senses and their objects. This Meditation rehabilitates the senses, but with limitations not recognized in the meditator's original sense-based epistemology. The material world is regained, but under a new conception.

The first half of the Meditation (7:71–80) considers "whether material things exist" (7:71). It starts with a merely probable argument for their existence, then reviews the sensory doubt, and finally offers a proof of their existence. The second half (7:80–90) examines the embodied mind, including the origin and function

of sensations, emotions, and appetites. It describes how the senses and appetites function in the whole human being (comprising mind and body) to preserve health and well-being, including the role of the nerves and brain in producing sensations and feelings.

Many discussions of this Meditation focus on the second titular topic, "the real distinction between mind and body." In Descartes' technical terminology (derived from the scholastics), a "real distinction" is between two substances (7:13, 162; see also 8A:28–29) – in this case, between substances having mutually exclusive essences (thought and extension). The argument for this distinction occupies a single paragraph (7:78), the penultimate in the long discussion of the existence of material things. In the flow of the text, the argument reads simply as the initial step in the coming proof that material things exist. Nonetheless, the distinction is central to Descartes' metaphysics and conditions his theory of sensation and appetite as manifestations of mind–body union and interaction.

The Sixth Meditation completes Descartes' analysis of the human cognitive faculties. It situates the senses and imagination by describing them as modes or acts of the intellect (7:78). These acts are distinguished from "pure intellect" by their dependence on bodily processes. This dependence figures into both arguments for the existence of body.

INTELLECT VERSUS IMAGINATION (7:71–73)

The initial (merely probable) argument for the existence of material things relies on a phenomenal distinction between imagining something and perceiving it by the pure intellect (7:71–72). Appealing to an experiential difference between these two acts, it contends that the phenomena are best explained by supposing that, when imagining something, the mind interacts with the body. As in the Second Meditation, "imagining" and "imagination" are technical terms arising from a standard classification of the cognitive faculties shared by Descartes and the Aristotelians: to imagine something means literally to form and experience a mental image of it. The term "image" readily suggests a visual image, but any type of remembered or constructed sensory

representation could count as an image, whether visual, auditory, gustatory, olfactory, or tactual.

In considering how she thinks of geometrical figures, the meditator notes that some figures are understood without forming a clear image. With a chiliagon, we cannot distinctly imagine all its thousand sides, even though we clearly understand that it is a thousand-sided figure. An image we might form in thinking of it needn't differ from that formed in thinking of a myriagon (a ten-thousand-sided figure). But we clearly understand, or intellectually perceive, that the myriagon and chiliagon are different. Accordingly, the real work is done not by images but by the intellect operating on its own (the pure intellect). For simpler figures, such as a triangle or pentagon, we may indeed form a well-defined image, but here as well the meditator notices a difference between imagining the figures and understanding them without an image (also 7:387, 389).

Descartes illustrates this crucial phenomenal difference:

> I can of course understand the figure of a pentagon, just as I can that of a chiliagon, without the help of the imagination; but I can also imagine a pentagon, by applying my mind's eye to its five sides and the area contained within them. And in doing this I notice quite clearly that imagination requires a peculiar effort of mind that is not required for understanding; this additional effort of mind clearly shows the difference between imagination and pure understanding.
>
> (7:72–73)

Forming an image of the pentagon involves an "additional effort," beyond the act of understanding. Does pure understanding (or pure intellection) of the figure involve any image at all, perhaps one devoid of sensory qualities such as color? Descartes does not say, but the contrast here between understanding and imagining the figure suggests that intellectual perception of the pentagon does not involve imagery of any sort. Exactly what it would be is unclear, but presumably it would involve non-imagistic cognition of the essential properties of the pentagon, including its spatial structure and the relations among its parts.

The argument for the probable existence of the body unfolds in two further steps. First, the meditator notes that imagination is not essential to mind or pure intellect. From this, she infers that the faculty of imagination requires something besides the mind (i.e., a body) for its operation.

> I consider that this power of imagining which is in me, differing as it does from the power of understanding, is not required by my own essence, that is, by the essence of my mind. For if I lacked it, I would undoubtedly remain the same individual as I now am; from which it seems to follow that this power depends on something distinct from myself. And I easily understand that, if there did exist some body to which the mind is so joined that it can, when it wants, apply itself so as to inspect it (as it were), it may possibly be that by means of this very body I imagine corporeal things. So the difference between this mode of thinking and pure understanding may simply be this: the mind, when it understands, in some way turns toward itself and inspects one of the ideas that are within it; but when it imagines, it turns toward the body and considers something in the body that conforms to an idea either understood in itself [as in imagination] or perceived by the senses.
>
> (7:73*)

The first point, that the pure understanding is essential to the self or thinking thing, arose in the Second Meditation, which also listed imagination and sense experience as acts of mind. Imagination is now classified as inessential to mind. This conclusion may well result from the meditator having, in Meditations 3 and 4, abandoned the senses and imagination entirely (7:34, 53) and yet retained integrity as a thinking (and intellectual) thing. Indeed, at this point the thinking thing – although known only as a substance of unknown type – is conceived as a non-extended mind (7:53) possessing the faculties of (pure) intellect and will.

The second point, that because imagination is not essential to mind it depends on something else, is new. It apparently relies on the assumption that all the properties that the thinking thing possesses on its own must be entirely explicable through an essential property, in this case, pure intellect. Within traditional

Aristotelian notions of substance and essence, this is an odd point. An Aristotelian would think that substances have some properties that flow from their natures or essences and other properties that are "accidents." For example, rationality would be considered essential to human beings, with individual acts of reason being instances of that essential property. Skin color would be regarded as "accidental" or non-essential, and yet all human beings possess on their own some color or other.

Descartes' assumption that all the properties that a thing can possess by itself depend on essential properties is related to his notion of substance as discussed in Chapters 5 and 7. There we learned (in language from the *Principles* [8A:25], but consistent with this Meditation [7:78]) that all modes or properties of substances depend on or presuppose a principal attribute, through which they are conceived. Let us call this position "constitutive essentialism." It says that every mode or property of the thinking thing must be conceived or understood through an essential attribute, in this case, the attribute of thought.

The above passage now adds a new wrinkle to constitutive essentialism. We learn that if a whole class of modes is not essential to a thinking thing, we must invoke both the thinking thing (of which they are modes) and something else to explain their occurrence. Acts of pure intellection are, as a class, essential to the mind. Acts of imagination are not. Presumably, what isn't explicable through one thing or substance on its own must be explained through the interaction of two or more things or substances. Acts of pure intellect involve ideas that the mind can produce by itself, out of its own latent structure (as constituted by God), including purely intellectual ideas of the essence of matter. But the images of imagination are not essential and so require something else for their explanation.

The meditator speculates that if the mind were "joined" to a body, imagination could be understood as arising through mind–body interaction. In order to produce images, the mind would engage the body. The need to "turn toward" the body presumably accounts for the special effort involved in imagination. The language in the quotation, of the mind "inspecting" or "considering" something in the body, is quite striking but ought not be read

literally (see Ch. 9). We may speculate that in these cases the mind is supposed to interact with a structure in the body that actually possesses the imagined shape: that in imagining a triangle, the mind interacts with (but does not literally look at) a triangular figure in the brain. On this reading, the non-essential power of imagination arises through causal interaction with a body distinct from mind.

It is, however, only "probable" that the faculty of imagination requires mind–body interaction, hence only probable that the body exists. The argument is merely probable because, in the meditator's present state of knowledge, other explanations have not been ruled out. Desiring an argument that "necessarily concludes" (7:73) that body exists, she presses on by considering some ideas long ignored, the ideas of the senses, including sensory ideas of shape, size, position, and motion, and of "colors, sounds, tastes, pain, and so on" (7:74).

REVIEW OF DOUBT ABOUT SENSES (7:74–78)

Descartes has the meditator review her previous beliefs about the senses and the reasons for doubting those beliefs, before deciding what to believe now (7:74). Although this review is not demanded by the ensuing argument that material things exist, Descartes devotes two long paragraphs to it (7:74–77). They serve a double function. First, they articulate more fully the previous beliefs about the senses, including both those to be retained and those to be fully rejected. Second, they explain how the to-be-rejected beliefs would have precluded the meditator from discovering the truths of the Meditations if she hadn't engaged in the process of doubt.

Here are the kinds of sensory beliefs earlier put into doubt (in Meds. 1 and 3), some of which will be rehabilitated:

(1) the existence and properties of material objects;
(2) the thesis that something in external objects "resembles" the qualities found in experience (such as color); and
(3) the "teachings of nature," to avoid pain and eat when feeling hungry.

In (1), Descartes details grounds for sensory doubt from Meditation 1. These are sensory deception, as when square towers appear round in the distance; the dream argument; and the defective-design argument. The latter two also undermine (2), for sensations can't resemble external objects that don't exist or are wholly different from how we perceive them. Item (3) concerns why we find pain distressing and are inclined to eat when we feel hunger. At this point, the meditator finds no intelligible reason why the bare sensations of pain or hunger should be distress-producing or food-orienting. Apparently, nature has simply instructed us (or the will) to judge that we should avoid pain and eat when feeling hungry (7:76). The meditator reprises the reason given (Med. 3, 7:39) for questioning such teachings: "since I apparently had natural impulses toward many things that reason urged against, I concluded that the things taught by nature are not much to be trusted" (7:77). If the teachings of nature sometimes lead us astray, how can we ever trust them? (This parallels the argument from sensory fallibility in Med. 1.)

Of factors (1) to (3), only (2), the resemblance thesis, comes to be rejected outright as part of a revised attitude toward the senses. Descartes soon gives arguments for both the existence of external things and the general reliability of the teachings of nature regarding bodily benefits and harms (7:83). He also reaffirms that the senses provide information about the properties of external things. In the present review, the meditator reports having sensations "of light, colors, smells, tastes, and sounds, the variety of which enabled me to distinguish the sky, the earth, the seas, and the other bodies, one from another" (7:75). She later reaffirms that such sensations do allow us to distinguish among bodies (7:81), while denying that such sensory ideas fully resemble the properties of material things. More precisely, she comes to reject the resemblance thesis for color, sound, odor, and the other so-called secondary qualities while allowing that, when used appropriately, our senses do inform us of real sizes, shapes, and other primary qualities (7:80–81).

Among the "previous beliefs" now in doubt, Descartes includes an empiricist theory of knowledge. The meditator previously embraced the resemblance thesis because she relied on sensory

ideas alone in forming her conceptions of things: "Since the sole source of my knowledge of these things was the ideas themselves, nothing could occur to me except that the things resembled the ideas" (7:75). But the Fifth Meditation has revealed a source other than the senses for our ideas of bodies, namely, innate intellectual ideas of their geometrical properties. Prior to that insight, the meditator (as, earlier, Descartes himself) had been an empiricist:

> In addition, I remembered that my use of the senses had come before that of reason; and I saw that the ideas which I formed myself were less vivid than those which I perceived with the senses and were, for the most part, made up of elements of sensory ideas. In this way I easily convinced myself that I had nothing at all in the intellect which I had not previously had in sensation.
>
> (7:75–76)

The theory of knowledge presented here is like that of Hobbes and Gassendi in the Objections and of subsequent empiricists such as Locke and Hume. Descartes distinguishes the "vivid" ideas of the senses from the "less vivid" ideas formed in reasoning. These less vivid ideas were "for the most part" composed from sensory ideas, a qualification that allows for creative imaginary constructions (as in the painter's analogy, Med. 1), for idealization or extrapolation from sensory ideas, and for emotions and volitions (not classified as "sensory ideas"). But this earlier attitude toward knowledge hewed to the Aristotelian theory that there is nothing in the intellect "not previously had in sensation," permitting the intellect no content of its own (such as innate ideas).

Descartes presents the meditator as originally inclined toward empiricism and a general resemblance thesis. This portrayal accords with the account of childhood prejudices due to sensory immersion from the *Principles* (8A:35–37), reviewed in Chapter 3. It meshes with the methodological claim that the meditative processes of the Meditations are needed for withdrawing the mind from the senses and discovering pure intellection. This cognitive resource, newly discovered in Meditations 2–5, can now be applied in proving that bodies exist, although perhaps not with the properties previously ascribed to them by the meditator.

The proof begins by stating general grounds for moving beyond the just-reviewed doubts: "Now, however, after I am beginning to know better both myself and the author of my being, I think that surely not all that I seem to have acquired from the senses is to be rashly admitted, but also that not all is to be called into doubt" (7:77–78). In herself, the meditator has uncovered clear and distinct perceptions. As for God, the Fourth Meditation has demonstrated that he would not create us with a nature that leads us to falsehoods we can't correct.

The first step in the proof pertains to mind–body distinctness. With mind and body established as distinct substances, external bodies are needed to explain the causal origin of sensory ideas.

MIND–BODY DISTINCTION (7:78)

The primary proof for mind–body distinctness occupies all of one paragraph (although a second argument is later sketched [7:86]).

Descartes had offered a proof in the *Discourse*, now to be stated more rigorously (7:8). In the *Principles* (8A:25–32), he explains the distinction at length, while reducing the argument itself to a summary.

THE *DISCOURSE* ARGUMENT

In the *Discourse*, the argument comes after the *cogito* reasoning but precedes the extraction of the truth rule and the proof for God's existence. It runs as follows:

> Next I examined attentively what I was. I saw that while I could pretend that I had no body and that there was no world, nor any place for me to be in, I could not for all that pretend that I did not exist. Indeed, on the contrary, from the mere fact that I thought of doubting the truth of other things, it followed quite evidently and certainly that I existed; whereas, if I had merely ceased to think, even if everything else that I had ever imagined had been true, I would have had no reason to believe that I existed. From this I knew that I was a substance whose whole essence or nature is only to think, and which does not require any place, or depend on any material thing, in order to exist.
>
> (6:32–33)

That mind is a substance distinct from body allegedly can be "known" (or "recognized," French *connaître*) from the fact that the existence of the material world can be doubted, while one's own existence, as a thinking thing, cannot be doubted (while one is thinking).

As critics immediately pointed out (in letters to Descartes now lost), this argument is fallacious. It is an argument from ignorance. The fact that one can doubt the existence of the body but not that of the thinking self does not prove that the mind is distinct from body and can exist on its own, for the thinking self and the body might actually be identical and yet the reasoner ignorant of that fact. If so, he could doubt the existence of body (including his own body) while affirming his existence as mind alone, simply through ignorance of his real identity.

To see that the argument is fallacious, consider a parallel argument concerning the identity of a masked man who is pursued by the captain of a garrison. Suppose the captain argues as follows:

(1) I cannot doubt the existence of the masked man, Zorro, for he is here before me.
(2) I can doubt the existence of the young nobleman, Don Diego; for all I know, he may have died suddenly.
(3) Therefore, Zorro cannot be Don Diego.

The captain's argument does not work, for it remains possible that Zorro is Don Diego. The argument simply reveals that the captain is ignorant of Zorro's true identity – that, in fact, he is Don Diego. If he knew Zorro's identity, then upon correctly identifying that Zorro was present he would know that Don Diego stood before him. Of course, even if Zorro were actually Don Alexandro, the above argument would not rule out Don Diego as the masked man, for it does not speak to Zorro's identity. Hence, whether mind is actually distinct from body or not, the *Discourse* argument fails.

Descartes responds to such criticisms in the Preface of the *Meditations*. He admits that the argument would be fallacious if it relied only on the fact that "the human mind, when directed

toward itself, does not perceive itself to be anything other than a thinking thing" (7:7–8). But he denies that in the *Discourse* passage he intended to assert the real distinction – even though the quoted passage leaves little doubt that he *did* draw that conclusion.

Descartes' unwillingness to admit an error is less important than his granting that the *Discourse* argument, if taken as an argument for the real distinction, would not work. He promises to show that a close relative to it does work – that is, to show "how it follows from the fact that I cognize nothing else [besides thought] as belonging to my essence, that nothing else in fact does belong to it" (7:8*). How does saying that he "cognizes nothing else" in his essence besides thought differ from saying that he cannot doubt he is thinking but can doubt that the body exists? The Synopsis (7:13) answers this question by comparing the meditator's epistemic position in Meditations 2 and 6. In Meditation 2, the meditator cannot doubt that she exists as a thinking thing but can doubt the existence of body. She has distinct concepts of mind and body, but she cannot rule out that mind and body might still, unbeknown to her, be identical (see 7:27). Once it is proven (in Med. 4) that "everything that we clearly and distinctly understand is true in a way that corresponds exactly to our understanding of it" (7:13), and the essence of matter is established as extension (Meds. 2, 5, and 6), the meditator can argue from distinct concepts of mind and body to the real distinction. It is (allegedly) no longer an argument from ignorance, for she now trusts that her concepts accurately portray the real natures of mind and body.

THE ARGUMENT IN MEDITATION 6

The meditator now considers an argument to show that her mind is a substance really distinct from bodies and their activity. (This implies that the mind is an "immaterial substance," a phrase used rarely by Descartes [e.g., 9A:207].)

Recall that a substance is "a thing suited to exist through itself" (7:44), or apart from everything else (except God, who preserves everything in existence [7:49; also 8A:24–25]). Given this definition, we can frame two different goals that Descartes

might be pursuing as regards mind–body distinctness. In one scenario, he might simply want to show that the self and its body are distinct in the way that any two individual substances might be, such as individual tables and chairs; self and body can exist apart from each other, as a chair can be moved back from the table. (This sort of numerical distinction between individuals is all that is required by the scholastic term "real distinction" [see 8A:29].) On this reading, his appeal to the differing essences of mind and body (viz., thought and extension) would merely be a way of establishing that the self and its body are numerically distinct independent things – but he would not be setting out purposely to show that mind and body are different kinds of substance. Their differing essences would serve as premises, incidental to the conclusion of individual distinctness. In the second scenario, Descartes would intend from the start to demonstrate that mind and body are different in kind (in an especially strong way). They are not merely different kinds of substance (as we ordinarily might think oil and water differ), but they have no attributes in common whatsoever (save the generic ones, existence, duration, and number). This sort of strong difference in kind fits Descartes' conception that each kind of substance is characterized by a distinct principal attribute through which its modes must be conceived (a conception thus far left tacit in the Meditations but invoked just after the present argument [7:78] and in the First Replies [7:120–21]). Indeed, Descartes suggests elsewhere that such attributes must be logical opposites, or mutually exclusive (9A:349).

Although some construe Descartes' argument along the first line, we will adopt the view that he was aiming from the start to establish a distinction in kind between mind and body. He needed a distinction in kind for the argument for immortality sketched in the Letter (7:13–14). More importantly, the distinction in kind is a central conclusion of his metaphysics. While the actual wording of the argument can suggest the first reading – indeed, the argument as worded concludes with a distinction between the individual self and its body – it is naturally read as aiming to distinguish two kinds of substance having nothing in common, which is how Descartes later described its conclusion (7:161, 170, 8A:25, 8B:348).

As developed in Meditation 6 (and explained in the Replies), this goal requires three conclusions, which may be regarded as conditions for a real distinction of kind. It must be shown that mind is a substance whose sole essence is thought, that body is a substance whose sole essence is extension, and that the two are mutually exclusive and so distinct. Adapting Descartes' own terminology, let us call the first two points the "complete thing" conclusions and the third point the "mutual exclusion" conclusion.

The three conditions may be set out as follows:

(1) *Complete thinking thing*: a thinking thing can exist as a substance whose sole essence is thought.
(2) *Complete extended thing*: body can exist as a substance whose sole essence is extension.
(3) *Mutual exclusion*: mental substance has no bodily modes, and bodily substance has no mental modes.

Despite first appearances, (1) and (2) do not already imply (3), except with specific assumptions or added premises. Under an Aristotelian conception, thought might serve as the essence of a substance lacking a body (e.g., an angel) but that need not preclude that some thinking substances (such as human beings) are in fact naturally and essentially conjoined with bodies and cannot naturally exist or operate independently of such bodies. To establish his point for an Aristotelian audience, Descartes needs both (1) and (3). Moreover, even on Descartes' constitutive-essence conception of substance, all three points are needed. On this conception, a substance's modes must all be understandable through its essence. This assumption, together with (1) and (2), can yield (3) only if it is already shown that thinking essentially includes no modes of extension and extension no modes of thought. Otherwise, mind and body might each be substances but might also exhibit the modes of the other (some or all minds might be extended; some or all bodies might think). To prove a real distinction of the intended kind, mutual exclusion is needed.

With this preparation in mind, let us consider the text. The relevant paragraph, divided into three parts for easy reference, runs in full:

> [A] First, because I know that everything that I clearly and distinctly understand can be made by God just as I understand it, it is enough to make me certain that one thing is different from another that I can clearly and distinctly understand the one without the other, since they can be separated, at least by God – and indeed, for judging that they are different, it matters not what power separates them.
>
> [B] Next, from the very fact that I know that I exist and that (for the moment) I observe nothing else at all as belonging to my nature or essence beyond this alone, that I am a thinking thing, I rightly conclude that my essence consists in this one thing, that I am a thinking thing.
>
> [C] And although I perhaps (or rather, as I will soon show, certainly) have a body that is very closely joined to me, nevertheless, because on the one hand I have a clear and distinct idea of myself insofar as I am only a thinking, non-extended thing, and on the other hand I have a distinct idea of body insofar as it is only an extended, non-thinking thing, it is certain that I am really distinct from my body and can exist without it.
>
> (7:78)

Questions arise concerning each part, and their relations. What role is played by the appeal to God's power in (A)? Does (B) by itself present the basic argument for a distinction in kind, or is it achieved only in (C)? Or is (C) an elaboration of (B) in response to an objection implied in the first clause of (C)? Let us consider each part in turn.

God and possibility

Passage (A) may seem to argue that because God can do anything, he can separate mind from body, so they really are distinct. That would be a weak argument, because it would appeal to the incomprehensible power of God to prove something about the created world. If it required the miraculous power of God to separate mind from body, no conclusion could be drawn about their natural relations in ordinary circumstances.

Passage (A) is not about miracles but pertains to the real possibilities of the natural (created) world. The notion of possibility in Descartes is complicated by his doctrine that God freely created the so-called eternal truths – including the truths of mathematics and the very essences of things – and could have created them otherwise than he did. But Descartes did not conclude from this doctrine that the human mind cannot know real possibilities for the world as created. As we will see in Chapter 9, he held that God created some unchanging eternal truths and adjusted our minds to them. Hence, as discussed in Meditation 5, our clear and distinct intellectual perceptions reveal the real possibilities of things. God need not be mentioned here; it would be enough to recall that our clear and distinct perceptions inform us of real possibilities. Indeed, the quotation says that "what power" effects the separation is irrelevant to our judgment of a real difference (see also 7:170). Descartes in fact believed that the mind separates from the body when the latter stops functioning (7:153). Hence, under the natural circumstance of death, the two substances separate. Such circumstances could not be mentioned here, because the notion of a well-functioning human body enters the Sixth Meditation only later.

Passage (A) does two things. First, it reaffirms clear and distinct perception as a guide to real possibility (that is, to what can actually occur or exist). Second, it provides a criterion for a real distinction. If two things can exist apart, then they really differ. Two things can exist apart if "I can clearly and distinctly understand the one without the other." The conditions for such understanding are given in points (1) to (3) above. And, indeed, Descartes describes this very set of conditions, including the mutual-exclusion conclusion, in explicating his argument in reply to Caterus (7:120–21, quoted below).

Clear and distinct understanding

Passages (B) and (C) rely on clear and distinct perceptions, the first tacitly, the second explicitly. Passage (B) reports two facts: that one knows one's own existence (the initial *cogito* conclusion); and that one "observes" (or "notices," Latin *animadvertere*) "nothing

else at all as belonging to my nature or essence beyond this alone, that I am a thinking thing." From these facts, the inference ensues "that my essence consists in this one thing, that I am a thinking thing." (Here the "I" is restricted to the self as conceived in previous Meditations [7:78, 81]; Descartes will subsequently argue that this "I" forms a whole human being by being conjoined with the body, and that this union is essential to a whole human being [7:88, 228; see also 8B:351].)

Passage (B) excludes everything from the essence of the self or the "I" except thinking. Does it thereby preclude the "I" from being a process of a body, or from having corporeal attributes? That depends on whether it follows from the fact that the self's essence is thinking that it is distinct from body and lacks bodily attributes. The assumption of constitutive essentialism might help here. If thinking is the essence of the self, and if the concept of thinking includes no modes of the body, then constitutive essentialism implies that the self lacks all bodily attributes. (Descartes presents no argument for constitutive essentialism, but he may have considered it apparent to the "natural light" upon a full analysis of the notion of a "mode" as simply a modification of the essence or being of a thing – hence a thing's essence should provide the basis for all its modes [7:79; see also 8A:25, 8B:348–49, 355, and 5:404–5].)

Of course, it must be established that the meditator has a clear and distinct idea of herself as only a thinking thing. Here some previous results can be brought to bear. In Meditation 2, the meditator learned that she could cognize herself as a thinking thing and could achieve an understanding of herself while ignoring all bodily attributes. Descartes now asks the meditator to affirm that this conception of the self as a thinking thing is a clear and distinct perception of an essence – akin to the clear and distinct conception of extension achieved in Meditation 5 and consolidated in the present argument. Earlier in Meditation 6, she has affirmed that sense and imagination, which seem to require a body as their cause, are not essential to a mind. She can be a mind even if she lacks sense and imagination with their required relation to a body. Finally, passage (B) claims that the meditator perceives that "nothing else at all" belongs to her essence except

thinking, which presumably excludes the attributes of body. If she finds that these points do describe her conception of herself, then, on the assumption that clear and distinct perceptions reveal the real possibilities of things (and assuming constitutive essentialism), she knows that a purely thinking substance can exist, possessing no bodily attributes.

Even if this reading of (B) is correct, it relies on an assumption (constitutive essentialism) and implied assertion (that the phrase "nothing else at all" is meant to exclude bodily attributes) that are not spelled out. Descartes might have felt the need to make the points explicitly, or to add an additional argument.

The argument in (C)

The core of (C) is the claim to have clear and distinct ideas of the self as a thinking, non-extended thing and of body as an extended, non-thinking thing. From these ideas, the conclusion is drawn that the "I" or mind is "really distinct" from body (and so from its body).

Passage (C) offers the following clear and distinct ideas:

(i) The self is simply a thinking and non-extended thing.
(ii) Body is simply an extended and non-thinking thing.

These points suggest that mind and body are conceived differently and mutually exclusively. If accepted, they support the mutual-exclusion conclusion. But that by itself does not entail that mind and body are distinct substances. For that conclusion to follow, it must be shown that each can be a substance. For (i) and (ii) to yield an argument for real distinctness between substances, we need to know that mind can exist on its own independently of body (and vice versa). We need the complete-thing conclusion.

We can now bring passage (B) into play again, this time without needing constitutive essentialism. (B) asserts that each of us knows we exist as a thinking thing whose sole essence is thought. It asserts the complete-thing condition for minds. Without further preparation, Descartes asserts the same conclusion for bodies in (C). Accordingly, each can exist as a complete

thing and, drawing on points (i) and (ii), we have met conditions (1) to (3) above.

Putting the three passages together, (A) provides the criterion for a real distinction between substances (capability of existing apart) and offers clear and distinct perception as the way to determine whether the criterion is met. (B) affirms that a thinking thing can exist on its own. (C) affirms that this thinking thing has no properties peculiar to bodies, while implying that bodies can exist on their own. If the mind can exist as a thing having no bodily properties, it can exist apart from bodies. Hence, by the criterion in (A), mind is a substance really distinct from body.

The argument as a metaphysical insight

Described in this way, Descartes' argument takes the form of a metaphysical insight into mind and body. Meditation 2 prepares the meditator for thinking of mind independently of body, that is, for having a clear and distinct idea of mind unalloyed with any concept of body. The affirmation, in Meditations 3–5, that clear and distinct ideas are true, gives the meditator license to assert that the world is the way she clearly and distinctly perceives it to be. Meditations 2, 5, and 6 (in the present passage) offer a clear and distinct perception of the essence of body. Meditation 6 draws these insights together and asserts that mind and body are substances with mutually exclusive essences. Substances having nothing in common are really distinct.

In the Synopsis, Descartes describes the six Meditations as yielding just such an insight and lists their roles:

Meditation 2: "form a concept of the soul [or mind] that is maximally clear and is plainly distinct from every concept of body."

Meditation 4: come to "know that everything that we clearly and distinctly understand is true just as we understand it."

Meditations 2, 5, 6: "have a distinct concept of corporeal nature."

Meditation 6: insight that "all the things that we clearly and distinctly conceive as different substances (as we do mind and body) are in fact substances that are really distinct from one another" (7:13).

The actual argument in Meditation 6 adds little to this summary. The First Replies explicate the notion of a substance as a "complete thing" (7:120–21). The *Principles* develop the technical terminology further, describing thought as the "principal attribute" of thinking substance, through which all its "modes" are understood (8A:24–30). Beyond such explications, Descartes added no new elements when restating the argument in the Geometrical exposition (7:169–70) and *Principles* (8A:28–29). The argument consists of metaphysical insights into the mutually exclusive real natures of mind and body and their possible existence as complete things, thereby affirming them as really distinct substances. (A second argument [7:85–86], offered as an afterthought, contends that mind is indivisible and body is divisible and concludes they are really distinct, because each has a property the other cannot have.)

A persistent objection

Several of the objectors pressed Descartes on how he knew that a thinking thing or mind could not in fact be identical with certain "corporeal motions" in the body (7:100, 122–23, 200; 9A:207). In effect, they asked how he could know that he wasn't still arguing from ignorance about the real identity of thought with bodily processes.

In the First Replies, Descartes responds by invoking the notion of a "complete thing" and then arguing for mutual exclusion:

> I have a complete understanding of what body is, by thinking of it purely as something that is extended, shaped, movable, and so on, and denying to it anything that belongs to the nature of a mind. Conversely, I understand the mind to be a complete thing, which doubts, understands, wills, and so on, even though I deny that there is anything in it that is contained in the idea of a body. This would be entirely impossible if there were not a real distinction between mind and body.
>
> (7:121)

This response does not address the demand of Caterus (and the second objectors, 7:122–23) to know how Descartes could

ascertain that his understanding of mind as a non-extended thing was not, although seeming complete, actually an incomplete understanding. (Incomplete, on the possibility – which is exactly what is under dispute – that mind really is a bodily process.)

Arnauld developed this objection in detail (7:198–204), summing up his main point by offering a counterexample (an argument allegedly parallel to Descartes' in all relevant respects, but producing a clearly false conclusion):

> I clearly and distinctly understand that this triangle is right-angled, without understanding that the square on the hypotenuse is equal to the squares on the other sides. Therefore God at least can produce a right-angled triangle with the square on its hypotenuse not equal to the squares on the other sides.
>
> (7:202)

One can have a clear and distinct perception of a right-angled triangle without knowing everything about it, including not knowing the Pythagorean theorem. But, Arnauld observes, it does not follow that the unknown properties, such as the Pythagorean relation between the squares on the sides, are not actually properties of the triangle. So perhaps thought really is a bodily process, even though one can conceive of mind without thinking of body.

Descartes pointed out several problems with this argument (7:224–27). First, even if a triangle can be regarded as a substance, "the property of having the square on the hypotenuse equal to the squares on the other sides is not a substance" (7:224). Fair enough. Arnauld's objection does not really parallel the mind–body argument, which asserts that both mind and body can exist on their own. Second, Descartes claimed that if we clearly and distinctly understood the Pythagorean property, we would see that it does belong to a right-angled triangle. But, he asserted, if we clearly and distinctly understand the property of extension, we see that it does not contain thought. Third, he argued that we cannot deny that the Pythagorean theorem applies to right-angled triangles while having clear and distinct perceptions of both. But, he argued, we can do this for mind and body; if mind and body weren't distinct kinds of substance, we wouldn't be able to have a

clear and distinct perception of each independently of the attributes of the other.

These responses boil down to two claims: that we have a clear and distinct perception of mind as a distinct kind of substance from body (and vice versa), and that our clear and distinct perceptions tell us how the world is (or could be). If either claim is false, the argument fails. It could, for instance, be true that we have distinct concepts of mind and body and that we find each concept to be (in some sense) "complete." But if it is not also true that our concepts reveal the underlying structure of the world, the argument fails. It also fails if we are mistaken that our concepts of mind and body clearly and distinctly present them as capable of existing apart. Equally, however, if both claims are true, the argument works.

MIND AS INTELLECTUAL SUBSTANCE (7:78–79)

In moving toward the conclusion that external objects exist, Descartes examines further the essential properties of mind itself. He has the meditator again consider whether various mental faculties and modes of thought are essential to her existence as a thinking thing:

> I find in myself various faculties for certain special modes of thinking – namely, imagination and sense perception – without which faculties I can clearly and distinctly understand myself as a whole; but, conversely, I cannot understand these faculties without me, that is, without an intellectual substance in which they inhere. For their formal concept indeed includes some intellection.
>
> (7:78*)

Descartes here characterizes the thinking thing as "an intellectual substance" (see also 7:12, 9A:207). This accords with our finding in Meditation 2, that intellection is the essential feature of thought. The passage further claims that sensation and imagination are not essential to mind. It is not denying that sensation and imagination are types of thought that must exist in a mind; indeed, it says that they require an "intellectual substance" in

which to inhere. Sense perception and imagination are kinds of perception, and as such are species of intellectual act. (As explained in the *Principles*, perception is simply the operation of the intellect [8A:17], so any kind of perception is a kind of intellectual act.) But the meditator concludes that she could exist as a thinking thing without having such acts. Presumably, she is able to conceive of herself as a pure intellect who contemplates God, the mind itself, and the objects of geometry but has no sensations or bodily appetites. Descartes would ascribe those three objects of cognition to a disembodied mind, as the meditator now conceives herself to be.

In Chapter 4, we considered whether thought, or the thinking thing, has a core essential feature. Some philosophers interpret Descartes as making consciousness the essence of thought. But he does not say that directly, and here he characterizes mind as "intellectual substance." As noted, he regards all instances of intellection as a kind of perception; hence, sense perceptions and imaginings are instances of intellection inasmuch as they are perceptions. The comparison of ideas with images in Meditation 3 (7:37) suggested that ideas always represent; that Meditation attests that "there can be no ideas that are not as it were of things" (7:44). In the strict sense, all ideas represent individual things; more widely, "concepts" and "simple notions" (representing properties or relations common to many things) are also ideas (Chs. 4, 5). Descartes' statements in the *Meditations* indicate that all ideas somehow represent. It appears that, for Descartes, intellection (perception, or representation) is the central feature of thought.

In Chapter 6, we saw that will is a feature of mind distinct from intellect, and that both are required in the act of judgment. In the *Principles* (8A:17), Descartes says that all modes of thinking may be divided into acts of either intellect (perceptions) or will (volitions). The fact that he considered the will to be a distinct faculty of mind may seem to challenge the interpretation that intellection is the core essential feature of thought.

Scouring Descartes' writings, we find little to indicate why intellect and will count as separate mental faculties and what makes the operation of will an instance of thought. However, an

intriguing passage in the Sixth Replies speaks to their relation. Descartes explains that intellect (or understanding) and volition have a special "affinity or connection" and that we clearly perceive that "the thing that understands and the thing that wills are one and the same by a unity of nature" (7:423). What might this unity of nature be? The operations of both intellect and will are instances of thinking. That both faculties yield instances of thinking might provide a unity, but it offers little insight into their "affinity." Instances of volition and intellection are both accessible to consciousness, and if consciousness were the nature of thought, that might provide a "unity of nature." But conscious accessibility again does not describe a special affinity between them; it simply ascribes a common feature to them. However, taking intellection as the core feature of thought provides both unity of nature and affinity. All acts of will require an object (Chs. 5, 6). But mental presentations of objects are ideas or operations of the intellect; hence, will, too, presupposes intellection in its conception, thereby establishing an affinity. At the same time, it seems that intellection or representation can be understood without will. Because intellection or representation is more basic than will, it can count as the essential feature of the thinking thing, which would explain why the mind is denominated an "intellectual substance." (We return to the relation between consciousness and the nature of mind in Ch. 10.)

EXTERNAL OBJECTS EXIST (7:78–80)

Because acts of imagination and sensation are not essential to the self conceived simply as a thinking thing, the meditator wants an explanation for why such acts occur in her own mind. She now notes a feature that distinguishes sense perceptions from the acts of imagination recently confronted. Imaginings can be controlled by the will; one may choose, or not choose, to imagine a pentagon. But sensory ideas "are produced without my cooperation and often even against my will." Hence, she reasons, these ideas must be produced by "some substance distinct from me" (7:79). The question then becomes, given that we have sense perceptions, what produces them in us (that is, in our minds)?

The meditator considers three options. Our sense perceptions might be caused by bodies, by God, or by a created being "more noble than a body" (presumably, an angel). She assumes that if God or an angel caused our sensory ideas, those beings would contain the content or objective reality of the ideas "eminently." The notion of "eminent" containment was introduced in Meditation 3 and further explained in the Geometrical Arguments (7:41, 161); here, it means that God or an angel can cause ideas of shape in us, even though they are not bodies and so do not possess shape. But Meditation 5 has established the possibility that bodies having shapes can exist, and our sensory ideas present us with shaped bodies. Hence, the meditator assumes that if bodies cause sensory ideas in us, those bodies contain "formally and in fact everything that is found objectively and by representation in the ideas" (7:79, 9A:63). They will have the properties that our sensory ideas present them as having.

Because our sensory ideas seem to present us with shaped bodies, we naturally believe that such ideas present the actual properties of bodies. We have no faculty that could inform us if God or angels actually caused the content in our ideas. Echoing the argument of Meditation 4 concerning clear and distinct perception, the meditator now reasons concerning the cause of our sensory ideas: "I do not see how God could be understood to be anything but a deceiver if the ideas were transmitted from a source other than corporeal things." And since God is no deceiver (Meds. 3–5), "corporeal things do exist" (7:80).

The argument as given is compressed, and it raises some questions that are answered only later. But the fundamental assertion is clear: if a body causes a sensory idea in us, the idea reveals properties that really are in the body, on pain of God being a deceiver. And the epistemic implication is clear. Whereas, to this point, the meditator claimed knowledge only of herself and God but lacked knowledge of the material world, the present argument allows her to break through the veil of ideas to know facts about the external world. The argument concludes that external objects exist and possess "formally and in fact" what is presented "objectively" or "by representation" in the sensory ideas that they cause.

However, this last conclusion, from the fact that bodies having shapes cause in us sensory ideas of shaped bodies, to the conclusion that those ideas accurately portray the shape of the body in question, arises rather quickly. Why should we believe that, when a body acts as cause, our ideas present it as it is? Why should the effect accurately portray the properties of the cause? Gassendi raised this question, observing that "an efficient cause is something external to the effect and often of a quite different nature" (7:288). A cause need not resemble, or contain formally, what is found in its effect (see 7:39). (Indeed, Descartes held that God creates an extended universe but is not himself extended.) Although Gassendi's objection contained errors in interpreting Descartes' position and received only a perfunctory reply (7:366), his basic question is on target. It cannot be assumed that bodies in fact have a certain property simply because they cause an idea of that property when affecting a mind.

Descartes knew that an explanation was needed, for he himself sharply distinguished cases in which bodies cause sensory ideas of shape and other geometrical properties from those in which they cause ideas of color, sounds, and so on. In the latter cases, we have a natural inclination to affirm a resemblance thesis, which is false. In the conclusion of the argument that bodies exist, Descartes was sensitive to the difference between the two classes of cause:

> Still, perhaps not all corporeal things exist just as I grasp them through the senses, for the grasp of the senses is very obscure and confused in many things. But at least all those things are to be found in them that I clearly and distinctly understand, that is, all those that, considered generally, are included in the subject matter of pure mathematics.
>
> (7:80)

Although Meditation 5 has established that properties of the bodies are modes of extension, the present argument does not concern purely intellectual ideas of possible matter but sensory ideas of actual bodies. It requires that these sensory ideas present some properties that bodies actually have, else God is a deceiver. And given Meditation 4, it also requires that if some of our

sensory ideas lead us to affirm that properties exist in bodies that aren't there (such as color as a real quality), we are able to correct our mistake. These requirements are thus far unmet.

We seem to be missing a premise. It is supplied in the subsequent paragraphs, which examine more generally the reliability of the senses.

Descartes affirms straight away that the senses tell us things such as that "the sun is of such and such a size or shape" (7:80). Sensory ideas do, or can, inform us of the actual shapes and sizes of bodies (that is, specific geometrical properties of individual bodies). But he also affirms that there is some "truth" even in his sensations of "light, sound, pain, and the like." This second class of ideas had been described as "very obscure and confused" (7:43) in Meditation 3, and he has just repeated that description. But now he suggests that even these ideas contain some "truth."

Both types of perception, of shape and of light or color, contribute to what one "is taught by nature." Nature "considered generally" is "nothing other than God himself, or the coordinated system of created things established by God" (7:80). God has set up our sensory apparatus. He has given us a tendency to believe that things are as they appear. By itself, that might lead us to think that bodies are both shaped and colored (in the "real quality" or "resemblance" sense of being colored). But he also provided us with purely intellectual perceptions of the essence of matter. Hence we should be able to trust our senses to reveal to us, at least sometimes, the properties that we already know particular bodies can have, such as size and shape. Further discussion is needed to describe the "truth" in the sensations of color or pain.

The additional premise is that sensory ideas function to inform us of the properties of objects in the environment for the purposes of practical interaction. Accordingly, such ideas inform us of properties that bodies actually have. If some sensory ideas present bodies to us as having properties they actually have in the way presented (as size or shape) and some present properties that are not in bodies in the way presented (as color), we should be able to correct the resulting erroneous beliefs (such as the resemblance thesis for color) – or at least suspend judgment in unfavorable circumstances. And indeed the faculty of pure intellect (allegedly)

informs us that bodies actually can have the properties of size and shape. Therefore, we should believe that the senses will, under favorable conditions, reveal the true sizes and shapes of particular bodies. But we should also believe that sensory ideas of color are informative, as well.

The remaining Meditation elaborates the conception that sensory ideas inform perceivers of their environments for practical purposes. This role contrasts with that of the intellect in revealing the essences of things. The discussion begins with a fundamental tenet of Descartes' theory of sensation, that sensory ideas and appetites arise from mind–body union and interaction.

MIND–BODY UNION (7:80–81)

The teachings of nature are judgments arising in connection with mind–body union. These judgments concern sensations, including those that pertain directly to bodily states, such as pain, hunger, and thirst, as well as those pertaining to external objects. Examples of such judgments were mentioned in reviewing the doubt, including the judgment that pain is distressing, or that the feeling of hunger means that we need food (7:76).

BODILY SENSATIONS AND MIND–BODY UNION

Descartes first considers teachings that concern the sensations that pertain to the human body itself. The meditator reasons:

> There is nothing that my own nature teaches me more vividly than that I have a body, that when I feel pain there is something wrong with the body, and that when I am hungry or thirsty the body needs food and drink, and the like. And so I should not doubt that there is some truth in this.
>
> (7:80)

My nature is bestowed by a nondeceptive God, so I should be able to trust it. But how do we know when to trust it, and when not? Descartes suggests that (at least some aspects of) judgments concerning our vivid sensations can be trusted. Pain, hunger,

thirst, and other bodily appetites are strong elements of our experience and lead to immediate judgments. And yet, as Descartes repeatedly avers, some impulsive judgments from childhood regarding our strong sensations, such as the resemblance thesis for color, are not trustworthy. So there must be something besides vividness that certifies our natural judgments. Presumably, this factor is that the considered judgments of the intellect provide us with no reason to think that pain, hunger, and so forth are generally misleading concerning our bodily state. On the contrary, we should expect that nature provides our obscure sensations of pain and hunger with content that appropriately influences the will to avoid painful things and to pursue food when feeling hungry.

The internal sensations teach the meditator not only that she has a body but also that she (qua mind) is closely united with it so as to form a unit (a whole human being):

> Nature also teaches me, by these sensations of pain, hunger, thirst, and so on, that I am not merely present in my body as a sailor is present in a ship, but that I am very closely joined and, as it were, intermingled with it, so that I and the body form a unit. Otherwise, when the body was hurt, I, who am nothing but a thinking thing, would not feel pain as a result but would perceive the damage purely by the intellect, just as a sailor perceives by sight if anything in his ship is broken.
>
> (7:81)

Sensations such as hunger or thirst provide evidence of a mind–body union. The argument for this union compares hypotheses about the character of our phenomenal experience, given its presence or absence. Absent a real union, in receiving information about the state of its body the mind would be like a sailor who observes his ship (assuming that the mind could "observe" its body even though it has no sense organs). The sailor sees that the ship has damage, but he doesn't feel it directly (or, if he has sympathetic reactions, they are not equal to felt pain). By contrast, we feel pain when our body is damaged. This pain does not have the character of a detached observation that, say, a knife has sliced the skin next to the thumb. In contrast with merely

surveying the damage (like the sailor), we experience a "confused sensation" (7:81). Presumably, pains are confused just because, although drawing attention to the damage with their phenomenal character, their content does not openly portray the detailed nature of the damage. Otherwise, the science of medicine would be easier, for we could have direct and detailed knowledge of our body's damaged or diseased states through introspection.

EXTERNAL OBJECTS AND THE TEACHINGS OF NATURE

The meditator now considers nature's teachings about external objects:

> I am also taught by nature that various other bodies exist in the vicinity of my body, some of which are to be sought after by me and others avoided. And certainly, from the fact that I perceive by sense a great variety of colors, sounds, smells, tastes, differences in heat, in hardness, and the like, I rightly conclude that in the bodies from which these various sensory perceptions arise there are variations that correspond to them, though perhaps do not resemble them.
>
> (7:81)

The first teaching, that other bodies exist, has just been established by argument but is here listed among the sensory contents we are taught by nature. The second teaching, that some surrounding bodies should be pursued and others avoided, is accepted because the teachings of nature derive from God and hence are trustworthy. The third teaching, that objects have differing properties corresponding to the various types of sense perception they produce in perceivers, is backed by the same general considerations about the function of sense perception. That is, even confused sensations, such as various colors or smells, correspond to real differences in the bodies that produce them. The surface of a red object differs in some specific way from that of a blue one.

Descartes subsequently reviews cases in which the teachings lead to error and, in response, places restrictions on the types of thing that sense perceptions should be expected to reveal. But he affirms that the senses are generally to be trusted where bodily

benefit or harm is at stake, a function that requires awareness of the layout of bodies around us and their salient properties. Accordingly, our sensory ideas provide knowledge of a world beyond themselves.

OBJECTIONS TO MIND–BODY UNION AND INTERACTION

In the quoted passages, Descartes makes two sorts of claim: first, that for purposes of bodily preservation, various internal and external sense perceptions are reliable guides to properties in the extramental world; and, second, that such perceptions arise through mind–body union. The first claim garnered little response from the objectors. The second claim, about mind–body union, was challenged. Descartes was committed to a two-way interaction between mind and body: body affects mind in sensation and mind affects body in voluntary action. (He mentioned the mind's effects on body only incidentally in the *Meditations* [7:84].)

Gassendi asked whether two substances sharing no properties could causally interact (7:337–45) and Descartes said little in reply (7:388–90). A powerful challenge on this point came from Descartes' friend and correspondent Princess Elisabeth. Having read the *Meditations*, on 16 May 1643 she asked Descartes:

> I beseech you to tell me how the soul of a human being (since it is but a thinking substance) can determine the spirits of the body to produce voluntary actions. For it seems that every determination of movement arises from an impulsion of the thing moved, according to the manner in which it is pushed by that which moves it, or else from the qualities and shape of the surface of this latter. Contact is required by the first two conditions and extension by the third. You entirely exclude extension from your notion of the soul, and contact seems to me incompatible with an immaterial thing.
>
> (3:661)

Elisabeth refers to Descartes' doctrine that bodily movements are controlled, physiologically, by subtle matter known as "animal spirits." In executing voluntary movements, the mind must control

the direction (or "determination") of the spirits. These spirits are material and so have only the properties of extension (size, shape, position, and motion). If mind is unextended, how can it direct the spirits? For, as she sees it, one thing can alter the direction of another only by pushing it or channeling it with its surface. But pushing requires contact and channeling requires a surface, so both require extension. How could an unextended mind have a surface, or make contact with a body?

Descartes answered soon (21 May) and at length. He explained that in thinking about such questions, three things must be distinguished: our concept of mind, of body, and of mind–body union (3:665). In the *Meditations*, he had focused largely on the first two notions, and hence on mind–body distinctness. However, in the Sixth Replies he had compared mind–body union to the relation between gravity and extended bodies (7:441–42). Gravity belongs to a whole body, even if it is deemed to act from a single geometrical point (the center of gravity). Accordingly, just as we believe that a body's heaviness can cause a body's motion without itself being extended, so too we should think of mind as able to act on body even though it is not extended (3:667–68).

Elisabeth (letter of 20 June) immediately saw the weakness of this response. As Descartes had admitted to her (3:668), he did not believe that gravity is a real quality acting on extended matter. Rather, he held that gravity results from the contact of rapidly moving, minute particles on the surfaces of the larger bodies that fall to earth. Elisabeth rightly wondered why comparison with a false notion of gravity should resolve her problem. With dry humor, she proposed that the distractions of being a princess must have dulled her mind, accounting for her

> stupidity in being unable to comprehend, from what you had previously said concerning weight, the idea by which we should judge how the soul (non-extended and immaterial) can move the body; nor why this power, which you have then under the name of quality falsely attributed to it as carrying a body toward the center of the earth, ought to persuade us that a body can be pushed by something immaterial.
>
> (3:684)

She rightly places the fault in Descartes' response, not her comprehension. Pressing her point, she allows that "it would be easier for me to concede matter and extension to the soul, than the capacity of moving a body and of being moved by one, to an immaterial being" (3:685).

Eight days later (28 June), Descartes conceded the weakness of his previous effort and tried again, invoking three "primitive notions" – of mind (or soul), body, and mind–body union – in relation to the cognitive faculties by which they are known:

> The soul is conceived only by the pure intellect; body (i.e., extension, shapes, and motions) can likewise be known by the intellect alone, but much better by the intellect aided by the imagination; and finally, what belongs to the union of the soul and the body is known only obscurely by the intellect alone or even by the intellect aided by the imagination, but it is very clearly known by the senses.
>
> (3:691–92)

It is no surprise that mind is known by pure intellect alone; since the Second Meditation, it has been accepted that imagination does not grasp thought as a property or attribute. Similarly, it is expected that extension is known by pure intellect, even if the imagination can help (for triangles and pentagons, if not chiliagons). However, it is surprising that the mind–body union is known "only obscurely" by the intellect (or intellect and imagination) but "is very clearly known by the senses." This statement is odd, because Descartes assigned mature judgments of sensory matters to the intellect, not the senses (7:438). So how shall we understand his point?

Descartes has conceded that he could not offer (or even form) a clear conception of mind–body union and interaction. He fell back to an argument from elimination. He trusted his metaphysical conclusion – perceived with clarity and distinctness – that mind and body are distinct substances. With substance dualism firmly in place, he considered how sense perception might work. The "senses" – or rather, the fact that sense perception occurs – tell him that mind and body must interact. For he has proven that sense perception normally is caused by external bodies (as opposed

to an event originating in the brain, or God instead of an external body). Similarly, because acts of volition result in bodily motions, mind must influence body. With the mind–body distinction in place, a theory of mind–body union and interaction becomes necessary. Descartes does not elucidate the interaction but proposes that it must occur, since mind and body are distinct and yet we do sense and act.

Elisabeth was not buying. Responding three days later, she wondered whether there might not be "unknown properties" in her mind that would reverse Descartes' immaterialist conclusion and explain mind–body interaction. In her view, even if his arguments showed that thought does not *require* extension, they did not show that thought and extension are *incompatible*. While pure thought may not require extension, sensing and voluntary motion seem to. At least provisionally, she was prepared to suppose that, in performing these functions, mind is extended (4:2). She did not find that Descartes' arguments truly had ruled out this possibility.

Descartes' argument for interaction stands or falls with his substance dualism. The denial of dualism, while not resolving all questions about mind–body relations, would change the framework for thinking about interaction.

ROLE OF SENSES VERSUS INTELLECT (7:82–83)

Having rehabilitated the senses for everyday use, Descartes draws the crucial contrast separating his theory of the senses from that of the Aristotelians. He separates the legitimate teachings of nature from the "ill-considered judgments" of childhood (the latter were included as "apparent" teachings of nature in Med. 3 [7:38]). The legitimate teachings of nature concern the existence of specific external objects that may yield bodily benefits and harms. The prejudices of childhood go beyond these legitimate judgments to accept a tacit theory of sensory qualities along with some erroneous judgments about the sizes and shapes of things.

Here are some cases of childhood prejudice:

> the belief that any space in which nothing at all is happening that affects my senses is empty; or that in a body (for example) heat is

> something exactly resembling the idea of heat that is in me, or that in a white or green body there is the same whiteness or greenness that I perceive by sense, or in a body that is bitter or sweet the same taste, and so on; or, finally, that stars and towers and other distant bodies have the same size and shape that they present to my senses, and other examples of this kind.
>
> (7:82)

The prejudices include three cases of forming an errant theory about the existence or qualities of bodies and one case of drawing conclusions about object properties under conditions known to yield error. In his physics, Descartes denied that there are any truly empty spaces; he held that a fine matter, known as æther, fills in where larger bits of matter are not found (8A:42–51). Yet some people believe otherwise. Why so? They have leapt to this conclusion in their childhood and retained the prejudice! Similarly, Descartes held that bodies contain particles that have various sizes, shapes, and motions, but he denied that they have the Aristotelian "real qualities" of color or taste (as in the resemblance thesis). Why do people believe otherwise? Prejudice again! And finally, someone might believe that stars or distant towers are actually very small. But, as noted even in Meditation 1, such errors fail to respect the known limitations of the senses. We should, for instance, not judge the sizes of very distant things from their appearances alone but should accept the need to draw closer, or to make measurements, to establish their true sizes.

There is a problem here. Both the legitimate teachings of nature and the prejudices of childhood produce a current inclination to make a judgment – that pain is to be avoided, or that a color sensation resembles something in objects. How are we to tell which impulses result from a legitimate teaching and which from childhood habits? That is where the intellect comes in. Speaking of her nature insofar as she is a mind–body unity (as opposed to a mind alone), the meditator affirms:

> My nature, then, in this limited sense, does indeed teach me to avoid what induces a sensation of pain and to seek what induces a sensation of pleasure, and such things. But it does not appear to teach us

> to draw any further conclusions at all from these sensory perceptions about things located outside us, without a previous examination by the intellect.
>
> (7:82*)

The intellect must, then, provide some teachings of its own that allow us to sort out legitimate teachings from prejudices. From the senses, we can conclude that bodies that induce pain should be avoided, and so on; but we should avoid drawing further conclusions about external things until the intellect has been consulted. And the intellect will tell us to reject the resemblance thesis about color (see Ch. 9).

Descartes compared the roles of the senses and intellect as follows:

> Strictly speaking, sensory perceptions were given by nature simply to signify to the mind what is beneficial or harmful for the composite of which the mind is a part; and to this extent they are clear and distinct enough. But I misuse them by treating them as reliable touchstones for discerning the essence of bodies located outside us, which essence they signify only very obscurely and confusedly.
>
> (7:83*)

The senses tell us about benefits and harms. For that purpose, our sensory ideas are clear and distinct enough, which presumably means they allow us to tell objects apart, to keep from running into things, to distinguish food from rocks, to avoid open fires, and so on. Beyond that, as previously mentioned, they permit us to determine facts about the world, such as the size and shape of the Sun. (With the Sun, reasoning is involved in working out its true size, but such reasoning relies on sensory observations.) But the senses do not reveal the essences of things.

Here is the crux of Descartes' cognitive revolution. The essences of things are not revealed through sensory experience but through the intellect. An Aristotelian could accept that statement but would mean something different by it. For the Aristotelians, the intellect operates on sensory materials to extract the essences of things. For Descartes, the intellect operates on its own, independently of

the senses, in perceiving essences. In his view, the Aristotelian method entrenches childhood prejudices such as the resemblance thesis about color. His method bypasses the senses to grasp extension as the essence of matter. The senses take on the roles of informing the knower of dangers and opportunities, signaling systematic differences in objects corresponding to sensory ideas of colors, sounds, and the like, and of presenting the shapes, sizes, positions, and motions of individual things. The pure intellect cannot discover the presence of such dangers and opportunities, or ascertain specific facts about objects, without sensory help.

ANALYSIS OF SENSORY ERROR (7:83–89)

In the Fourth Meditation, Descartes asked how the existence of human cognitive error could be reconciled with God's perfection. Now he asks how certain deceptions of the senses can be reconciled. These deceptions arise when the internal senses, although properly functioning, lead to a harmful result or a false conclusion. Such deceptions are not like the childhood prejudices that can be permanently banished by the intellect or avoided by suspending judgment. Rather, usually trustworthy teachings of nature go wrong. These teachings can be overridden but not changed. Descartes' solution places responsibility for these errors not on the free will of human beings but with God's design, while nonetheless excusing him of blameworthy deception.

Descartes gave this problem the lengthiest treatment of any topic in Meditation 6. Part of his interest was surely to reconcile the perfection of God – which he has invoked on numerous occasions – with the fact of occasional and unavoidable sensory deceptions. But part of his interest surely was to present his novel theory of the human body as an intricate machine.

Sometimes the teachings of nature lead us to do things that are not beneficial, as when someone ill with dropsy desires drink when drinking would be harmful. Or they may deceive, as when someone feels pain in a place with no injury, such as an amputee who seemingly feels pain in her missing hand (7:77; see also 1:420). These teachings are incorrect (it is bad to drink, the amputee has no hand). They can be corrected intellectually

inasmuch as the dropsical man knows not to drink and the amputee realizes that she has no hand. Nonetheless, in these cases, the erroneous sensory feelings produced by our nature persist, despite being overridden.

Descartes first considers explaining away such errors by attributing them to a disorder in the body alone, through a comparison with a badly made clock. Clocks are for telling time. When doing so badly, they depart from their intended function. Even though the spring, pendulum, and gears follow the laws of nature (7:84), the clock's operation deviates from the clockmaker's intention. Now consider the human body. Let us say that, in a nondiseased state, it is like a well-made clock; it does what it is "supposed" to do. When diseased, it is like a poorly made clock. Its parts still follow the laws of nature as laid down by God, but it malfunctions. Following this line of thought, the fact that the dropsical man wants to drink may be excused because the body is broken, and God presumably can't be held responsible for a broken bodily machine. (In the nature of things, anything with parts can break, for matter is intrinsically divisible.)

Descartes rejects this answer, saying "a sick human being is no less one of God's creatures than a healthy one, and it seems no less a contradiction to suppose that he has received from God a nature that deceives him" (7:84). His rejection turns on an analysis of what counts as the "nature" we are given by God. This nature is not the body considered alone, but the particulars of mind–body union and interaction. He rejects appeal to a broken bodily machine, because the body by itself contains no standard of well functioning and hence no standard for error (at least as regards the teachings of nature, which are the current topic). The comparison of a sick man and a badly made clock is merely "a denomination that depends on my thought" and is "extraneous to the things to which it is applied" (7:85). Although this part of the text is somewhat obscure, it clearly asserts that the notion of defect, in the case of errant teachings of nature, arises only in connection with mind–body union. It is only because the mind reacts to bodily states in a certain way that an error can be said to arise. God is (potentially) culpable because he instituted the mind–body relation.

Descartes is caught between using God's perfection and goodness (7:85) to underwrite the general reliability of the senses (including internal sensations) and wanting to show how God's perfection and goodness are consistent with errors arising from a system he created. His solution (1) makes God responsible for the errors in question, since he arranged the laws of mind–body union, and (2) argues that God did the best that could be done in setting up those laws.

Preferably, God would arrange things so that the brain state that causes thirst, or a feeling of pain in the foot, arises only when drinking would be good for us, or when the foot was really damaged. But, Descartes explains, God was constrained by the fact that the mind interacts with the body only at a central location in the brain. All information about the body's own states and about external bodies must be conveyed there by the nerves. Why this had to be Descartes does not say. Is it because the mind, being simple and unextended, cannot interact with the whole body and be directly affected by damage in the foot, or by the need (or lack thereof) for liquid in the stomach and intestines? But why should that be a rule for mind–body interaction? Descartes already describes the (unextended) mind as "turning toward" extended patterns in the body (e.g., in imagining a triangle), so what prevents it from interacting with the whole body rather than only a part of the brain? He appeals not to metaphysical necessity but to empirical evidence in supporting this aspect of his theory. That mind–body interaction occurs only in the brain "is established by countless observations, which there is no need to review here" (7:86; see also 6:109 and 8A:319–20).

Because mind–body interaction occurs in the brain, the mind must rely on "signals" arriving there from the nerves (7:88). These signals are motions set up in the nerves and brain (vibrations or other characteristic motions). The nerves are made of matter, which is by nature extended. A motion at the brain end of a nerve might have more than one cause. Suppose that normally a jab in the foot causes motion *R* in the brain, which in turn causes pain located in (and representing damage in) the foot. The motion in the nerve from the foot must be transmitted up the leg, through the spinal cord, and into the brain. Now suppose

that this nerve is caused to vibrate by a blow to the upper leg or to the back. It is possible that motion *R*, which signals pain in the foot, would result. A person would feel pain in the foot even though there is no damage there. Similarly, conditions in the stomach might jiggle the nerves in ways that make the person want to drink, even though the total state of the stomach and intestines is such that drinking is harmful. And so on for other signals.

Given that God decided to join a mind to a body and to place the body in a complex world, he was faced with the design constraint that nerves could be jiggled midstream or jiggled in an amputated arm to yield a misleading signal. Why must this be so? Because the best design for joining mind and body assigns a fixed meaning to brain signals. Descartes explained:

> any given movement occurring in the part of the brain that immediately affects the mind produces just one sensation in it; and hence no better system could be devised than if, of all the sensations it could produce, it produces the one that most effectively and most frequently is conducive to conserving the health of the human being.
>
> (7:87)

Usually, when we feel a pain in the foot, there is a problem in the foot. Usually, when we feel thirsty, we need to drink. Sometimes, we feel pain where there is no damage, or feel thirsty when it is not good to drink. These are real errors of nature, because they follow from our nature (7:88). But they arise in the best system of mind–body interaction that could be devised for beings such as ourselves. God goes with the usual case. Usually, the nerve from the foot is jiggled by damage to the foot, for it is encased in flesh and bone everywhere else.

To the complaint that God could somehow have arranged it so that our sensations never misled us, Descartes might repeat the Fourth Meditation point that God decided to create a variety of beings, including ones like us, warts and all.

Leaving theological justifications aside, this long section of Meditation 6 shows that Descartes believed that mind–body interaction can be studied empirically. The theory that mind–body

interaction occurs in the brain, just as the claim that mind and body do interact, is in the end established by facts of sense. Descartes considered many things about the nature of mind and matter to be settled by metaphysical investigation, independently of sensory evidence. But the existence and character of mind–body interaction was, for him, an empirical matter.

REMOVAL OF DREAM DOUBT (7:89–90)

The message of the second half of Meditation 6 has been that the senses are generally to be trusted in matters concerning the well-being of the body. The final paragraph teaches that the senses can be trusted more generally, at least if their reports are subjected to proper scrutiny using other faculties, especially memory and intellect. Now, at last, the "hyperbolical doubts of the last few days" about the senses can be dismissed as "laughable" (7:89).

To establish the trustworthiness of particular sensory reports, Descartes prescribes comparing such reports among themselves, using memory and intellect to adjudicate conflicts and avoid error. Certain sorts of error, such as mislocated pain, are inevitable but rare. Even without careful checking, because God is no deceiver we know our pains usually reveal the proper location of damage. Even so, we can check the foot visually or by touch if need be. If the foot has been amputated, we know there is no damage, despite our feeling pain as if in the toe. In other cases, such as the famous bent stick in water, we can use the intellect to correct our habitual, tacit judgment that the stick is bent (7:438–39). (We might even learn always to double check partially submerged sticks to see whether they are bent.) In summary, the senses are generally reliable about practical matters, and sensory reports can be checked further for error.

The policy of checking sensory reports against one another yields a proposed criterion for distinguishing waking from sleeping:

> I now notice that there is a vast difference between [being asleep and being awake], in that dreams are never linked by memory with all the other actions of life as happens when we are awake. ... But when

> things happen so that I distinctly notice where things come from and where and when they come to me, and I connect my perceptions of them with the whole of the rest of my life without a break, then I am quite certain that these things happen not in sleep but to one who is awake.
>
> (7:89–90)

If the senses, memory, and intellect confirm the continuity of our present experience with the past, then, since God is not a deceiver, "in cases like these I am completely free from error" (7:90).

In fact, we aren't free from error. Sometimes we awake from a dream believing it was real. Normally, we soon detect our error; but, despite what Descartes says, isn't the possibility of error always there? May not we merely dream that the criterion of continuity has been met?

Descartes admits that, with "the pressure of things to be done" (7:90), we don't always have time to stop and check, so mistakes happen. He might also have admitted that in a dream we can have the illusion of checking when we haven't really checked (though presumably such cases are rare). Do such possibilities undermine the trustworthiness of the senses? They might establish that sensory experience cannot be trusted in all cases. But Descartes didn't claim that it can be, and he didn't need to, for two reasons. First, his main purpose in the *Meditations* has been to establish the truths of metaphysics, which don't rely on the senses at all. With respect to the primary truths of metaphysics (the existence of mind, the essences of mind and matter, and the existence and essence of God), the senses don't enter the picture. Second, for other purposes, Descartes only needs assurance that the senses are on the whole reliable, and that with sufficient cross-checking they yield truth.

If Descartes meant that we should always be able to ascertain our freedom from sensory error, he asked too much. But he seems instead to have suggested that in the best cases we should trust our senses, because God is no deceiver and has given us no way to correct, and no reason to question, the best cases. In less than optimal situations, we can always suspend judgment, unless the needs of life force us to act.

THE WORLD REGAINED

The world as regained in the Sixth Meditation is not the same as the one called into question in the First. The difference, befitting the aim of the *Meditations*, is theoretical, including a new attitude toward the senses. While working through the Meditations, the meditator was to avoid oncoming carriages, eat food, drink liquids, sleep when tired, and engage in such social commerce as needed for day-to-day living. As Descartes made clear from the outset, the aim of his doubt, and so of his cognitive search, was not "action" but "the acquisition of knowledge" (7:22). So what knowledge has (allegedly) been attained?

The new knowledge concerns the method of gaining knowledge, the existence and attributes of God, the natures of mind and matter, the nature of the human being, and the role of the senses in guiding behavior and gaining knowledge. Methodologically, the meditator no longer believes that what is most true is learned "from the senses or through the senses" (7:18). She has learned that pure intellect is the ultimate standard of knowledge, one that she can access for herself. Using this faculty, she has discovered the essence of mind, the (true) idea of God, the resultant proofs of God's existence, the essence of matter, and the real distinction between mind and matter; as also (with sensory aid) the fact of mind–body union and interaction and the proper attitude toward the senses. The senses do not provide material for knowing the essences of substances, but they do inform us of a world beyond our sensory ideas. They are generally reliable for day-to-day living and, when used with proper care, can yield knowledge of the particular properties of bodies. The meditator has rejected her previous belief that bodies contain something resembling color, sound, and other secondary qualities. She now regards body as constituted through the modes of extension. Bodies must possess properties that cause color sensations (and other secondary sensations), but such properties are not detailed in the *Meditations*. Further description of the natural world is for other works – the previously published *Discourse*, the *Principles*, and the *Passions*.

We saw in Chapter 1 that Descartes intended his *Meditations* to support his new physics. The next chapter considers how and also

asks whether the standard of absolute certainty demanded in the *Meditations* in fact undermines Descartes' physics, at least where it must rely on experience. Descartes the physicist needs the senses and imagination as well as the intellect.

The whole human being who emerges at the end of the Meditations must re-enter the world in order to pursue physics as a natural science. He or she re-enters that world with a new appreciation of the power of the intellect and a new theory of the role of the senses. We must see if these findings can sustain the main objective of Descartes' philosophy, the construction of a new theory of the natural world, including the human mind–body complex.

REFERENCES AND FURTHER READING

Descartes' argument for mind–body distinctness has been discussed frequently; see Curley (ch. 7), B. Williams (ch. 4), and Wilson (ch. 6). Some interpret the argument as aiming for a distinction between individuals, for which the mutual-exclusion premise is unnecessarily strong. Marleen Rozemond, *Descartes's Dualism* (Cambridge: Harvard University Press, 1998), examines mind–body distinctness, union, and interaction and the theory of the senses, also detailing the large periodical literature. Contrary to herein, Rozemond, "The Nature of the Mind," in Gaukroger, *Descartes' Meditations*, 48–66, makes consciousness the essence of thought in Descartes.

Attention to Descartes' theory of mind–body union and interaction and theory of the senses has grown; see Kenny (ch. 10), Dicker (ch. 6), B. Williams (chs. 8, 10), Carriero (ch. 6), Cottingham, *Reason, Will, and Sensation* (Part 4), Gaukroger, *Descartes' Meditations* (ch. 11), and Detlefsen (chs. 6–8). Rodis-Lewis examines "Descartes and the Unity of the Human Being," in Cottingham, Oxford Readings, 197–210. M. Wilson, *Ideas and Mechanism: Essays on Early Modern Philosophy* (Princeton: Princeton University Press, 1999), includes essays on mind–body and the senses in Descartes. Essays in Gaukroger, Schuster, and Sutton (Parts 3–5) examine Cartesian physiology, the senses, and mind–body union and interaction. On the biological functioning of the senses, see

Hatfield, "Descartes' Physiology and Its Relation to His Psychology," in Cottingham, *Cambridge Companion*, 335–70, and Alison Simmons, "Sensible Ends: Latent Teleology in Descartes' Account of Sensation," *Journal of the History of Philosophy* 39 (2001), 49–75.

Some of Descartes' followers, and perhaps Descartes as well, ultimately concluded that God mediates all mind–body interaction (just as he is the cause behind all motion), so that no genuine causal interaction occurs between mind and body; but bodies are still the "occasional" cause of sensory ideas. This "occasionalist" thesis was developed by Nicolas Malebranche in *The Search after Truth*, trans. Thomas M. Lennon and Paul J. Olscamp (Cambridge: Cambridge University Press, 1997). Cartesian occasionalism is examined by Steven Nadler, "Occasionalism and the Mind–Body Problem," in M. A. Stewart (ed.), *Studies in Seventeenth-Century European Philosophy* (Oxford: Oxford University Press, 1997), 75–95, and Desmond M. Clarke, "Causal Powers and Occasionalism," in Gaukroger, Schuster, and Sutton, 131–48.

Descartes' side of his correspondence with Elisabeth is in CSMK; both sides are in AT and in *The Correspondence between Princess Elisabeth of Bohemia and René Descartes*, ed. and trans. Lisa Shapiro (Chicago: University of Chicago Press, 2007). On Elisabeth and other women philosophers in the seventeenth century, see Eileen O'Neill, "Women Cartesians, 'Feminine Philosophy', and Historical Exclusion," in Susan Bordo (ed.), *Feminist Interpretations of Descartes* (University Park: Pennsylvania State University Press, 1999), 232–57.

Part III

BEYOND THE *MEDITATIONS*

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9

THE NEW SCIENCE

PHYSICS, PHYSIOLOGY, AND THE PASSIONS

Descartes was a mathematician and natural philosopher before he was a metaphysician. From about 1630, he envisioned a new, comprehensive science of nature, whose construction and justification became his primary aim. The *Meditations* was to secure the metaphysical foundations of the new system.

To understand the role of the *Meditations* in establishing this new physics, we need to grasp the scope of the proposed new science. The root meaning of the word "physics" is "nature." However, the science of physics today is far removed from the complete world of nature as including mineral formations, plants, and animals (including their mental capacities). Present-day physics examines nature at very small (subatomic) or very large (astronomical or cosmic) scales. Other natural sciences, including chemistry and biology, are at or near the scale of living things. The mental world is now sometimes placed in opposition to the physical and natural worlds;

psychology (the study of mental life) is not always classed as a natural science.

In the classification of the sciences in Descartes' time, "physics" or "natural philosophy" meant simply the science of nature, encompassing everything having a nature or essence (at least on the Earth), extending to living things and their sensory and cognitive capacities, including human beings and human cognition. Aristotelian works on psychology (including *De anima*, "On the Soul," and related works on dreams, memory, and the senses) were classed within physics.

Descartes conceived of physics in this broad sense, to include animal and human physiology and even the *Passions of the Soul*, which studies felt emotions (11:326). While not openly placing the human mind itself into physics, he did include mind–body union and interaction. His substance dualism did not imply that the embodied mind is somehow unnatural, or supernatural, or beyond natural science. He did not intend to exclude mind from nature with his dualism.

Nonetheless, Descartes' philosophy realigned the relations between mind and matter and reconceived matter itself, reducing it to extension and its geometrical modes: size, shape, position, and motion. This changed how living things could be conceived. Descartes thought of plants and animals as machines, without the active principles and cognitive powers of Aristotelian physiology and psychology. In his mechanistic physiology, all bodily processes are interactions among particles according to laws of motion. He extended a notion of lawful regularity to mind–body interaction, positing permanent relations between brain states and the sensations, appetites, and emotions they produce in the mind. He saw no conflict between dualism and psychophysical laws.

This chapter examines Descartes' physics from its foundations in the *Meditations*, as elaborated in the *Principles*. Under the broad conception of physics, "physical" topics in the *Meditations* include not only the new concept of matter and God's role in conserving such matter (Meds. 2, 3, 5), but also the analysis of mental faculties (Meds. 2, 6), the theory of the senses and sensory qualities (Meds. 3, 6), and human physiology and mind–body interaction (Med. 6).

DESCARTES' REVOLUTION IN PHYSICS

The sixteenth and seventeenth centuries saw rapid intellectual change in Europe. The previously dominant Aristotelian philosophy gave way to new philosophies, including new philosophies of nature. Many factors contributed. Aristotelianism itself had changed over the centuries and was challenged by the revival of Platonism in the fifteenth century. It survived, although syntheses of Plato and Aristotle were common in the sixteenth century. In medicine and physiology, Aristotelian viewpoints combined with Galenic anatomy and physiology (Galen was a second-century physician in Alexandria, Egypt). In astronomy, Copernicus joined ancient standards of mathematical exactness with the desire for a coherent account of planetary motions, arguing that the Earth moves around the Sun (opposing the Earth-centered cosmos of Aristotle and of Ptolemy, a second-century Egyptian). In natural philosophy, ancient atomistic theories of matter were revived and discussed, finding some acceptance in chemistry and medicine.

Early in the seventeenth century, demand intensified for a "new science" of nature and a new philosophy to frame it. Francis Bacon called for systematic and direct observation of nature and for incorporating the empirical knowledge of artisans and craftsmen. The Italian anatomist Andreas Vesalius revivified the study of anatomy by publishing carefully prepared anatomical drawings based on dissections of human corpses. Galileo defended the Copernican system by challenging the assumptions of Aristotelian physics and Ptolemaic astronomy and through telescopic observation of the moons of Jupiter (denying Earth's alleged uniqueness as a center of revolution). Kepler advanced planetary astronomy using Tycho Brahe's accurate observations, articulated the theory of optical lenses, and gained a new understanding of the eye's internal anatomy. Harvey demonstrated empirically that the heart pumps the blood and circulates it several times per hour (versus the blood oozing slowly in its vessels without circulating).

These developments in the "Scientific Revolution" all occurred before 1633, when Descartes completed his *World*. But none of the authors mentioned proposed anything to rival Descartes' new vision of nature. The earlier innovators furthered single areas, as

with Galileo's new science of motion, or, as in Bacon's case, offered a new method intended, eventually, to generate a comprehensive new theory of nature. Descartes, besides making individual discoveries and offering a new method, proposed a comprehensive new theory in his *World* and *Principles*. He was the first to present a wide-ranging new system of nature, which was developed by his followers for more than fifty years after his death, before being displaced by Newton's physics.

OVERVIEW OF ARISTOTELIAN PHYSICS

The radical nature of Descartes' proposals is best understood against the background of the prevailing Aristotelian physics. A common Aristotelian position held that natural bodies are a composite of form and matter, and that matter could not exist without form. The form of a thing determined its nature or essence. Forms were principles of growth and change; they literally made things "be what they are" by directing the development and activity of matter toward an end (hence away from any lack or "privation" of that end). Nature was divided into a variety of kinds of substance, each with a characteristic pattern of activity. All bodies were thought to be composed of the four elements: earth, air, fire, and water. In these elements, undifferentiated prime matter takes on the forms of the four basic qualities: hot, cold, wet, and dry. Earth is cold and dry, air hot and wet, fire hot and dry, and water cold and wet. Other qualities, such as color and odor, also exist as forms that can be transmitted from bodies to the sense organs. In a substance such as a human being, color might be an "accidental" property not specified by the essence of that substance.

Explanations of the "motion" of these substances – meaning any alteration or change – appeal to the four causes. The material cause concerns the matter of a substance, which need not be prime matter but can be whatever is organized by the form; in an artifact such as a statue, it is the bronze. The formal cause concerns the characteristics of the substantial and accidental forms (the form of an oak tree, the color of its leaves); in the statue, it is the shape. The efficient cause impels the motion or change; in the

statue, it is the sculptor. The final cause is the end or purpose toward which the change is directed; in the statue, it might be the artist's desire to produce a likeness of Socrates. (Note that, as an artifact, the statue lacks the unity of a substance and hence its final cause comes from without.) Aristotelian natural philosophy taught that all four causes are relevant in all change. For instance, when the earthy element seeks the center of the Earth, its heading is determined by the final cause of reaching the center of the universe.

In the Aristotelian scheme, higher-level natural kinds divide into mineral, vegetable, and animal. In complex or "mixed" bodies (mixtures of elements), the four elements serve as the matter and a kind-specific form specifies the thing's characteristic pattern of activity. Thus, crystals or metals derive their properties from their forms (of quartz, gold, etc.). The pattern of growth of the oak tree is directed by its form (contained in the acorn). Similarly for the various kinds of animals, including the human animal. Each has a characteristic form, introduced into the reproductive "matter" of the female by the male during procreation. Certain powers or activities of this form are found across animal species – all animals have nutritive, reproductive, and sensory powers. The human animal possesses reason as its defining or essential power (and is known as the "rational animal"). The substantial form of each thing directs it toward its natural end, earth toward the center of the universe, the human being toward knowledge and wisdom. Aristotle's physics compared all natural processes to the biological process of growth. Teleology, or the idea of purpose, applies to all natural things, living or not.

Aristotelian physics strictly divided the heavens from the Earth. Because the earthy element seeks the center, the Earth is fixed in that location. Water has the same tendency, but less strongly, and so collects on the surface of the Earth. Air and fire have upward tendencies, the second stronger than the first. These elements are found in the region of change, extending up to the sphere of the Moon (which acts as a bubble around the Earth). The Moon, Sun, planets, and "fixed stars" (an outermost bubble) are carried around the Earth, embedded in crystalline spheres. These spheres are not composed of the four elements but of a fifth element, the

quintessence ("quint" means fifth), which is unchanging. This entire region above the Moon was deemed unchanging; the heavenly bodies revolve around the Earth in uniform circular motion (such uniformity was not counted as "change" or "alteration"). The apparently irregular motions of the planets (they seem to go backwards sometimes in relation to the fixed stars) was explained by compounding uniform circular motions with added spheres.

To gain acceptance for his new physics, Descartes needed to break the hold of Aristotelian physics on common sense. Aristotelian physics says that for a body to keep moving, force must be constantly applied. This accords with much everyday experience. Descartes' laws of motion say that a body moving in a straight line will continue in motion unless hindered. Aristotelian physics says that earthy matter naturally moves toward the center of the universe (and Earth). Descartes says that invisible subtle matter, swirling in a vortex around the Earth, pushes objects downward, and that the Earth is carried around the Sun by a similar vortex. Aristotelian physics says that each natural kind contains a substantial form that produces its characteristic activities, including the growth and development of living things. Descartes says that the various natural kinds differ only in the sizes, shapes, positions, and motions of their particles, and that animal bodies are mere machines. Aristotelian physics says that objects have the properties they appear to have, in the manner they appear to have them – that color, odor, and so on are real qualities encountered in sensory experience. Descartes says that, in objects, these qualities are really configurations of corpuscles that, in the case of color, induce spin in particles of light and ultimately cause a color sensation in the mind.

Descartes sought acceptance for a (then) counterintuitive picture of nature. We may find it difficult to appreciate the full force of his problem, since his vision of nature has been partly retained and informs today's common sense.

DESCARTES' NEW SYSTEM

In developing his new physics, Descartes drew upon the empirical findings and theoretical proposals of previous authors, including

the optical work of al-Haytham and Kepler, the astronomical arguments of Copernicus and Galileo, the circulatory theory of Harvey, and the revival of ancient atomism. But he moved beyond these results by proposing a new conception of homogeneous extended matter governed by a few laws of motion.

Although Copernicus and Galileo had challenged ancient physics and astronomy, neither offered a new system of physics to encompass both heavens and Earth. Descartes' physics did just that, appealing only to particles in motion to explain all phenomena throughout the material world – including the formation of the Sun and solar system, the revolution of the planets around the Sun, and, in principle, everything observable in the heavens and on Earth. Using his new conception of matter, he framed comprehensive and detailed theories for the known phenomena of light, heat, fire, weight, magnetism, various minerals, and the physiology of living things. His explanations were often fanciful, such as accounting for magnetism with corkscrew-shaped particles flowing out from the poles of the Earth, circulating north and south, and entering the opposite pole while passing through the threaded channels in any magnetic bodies encountered along the way – with left- and right-hand threading accounting for polarity (8A:275–310). They were unified in appealing only to the size, shape, position, and motion of particles. The role of Descartes' metaphysics was to establish these as the only properties of matter, which must therefore frame all explanatory hypotheses concerning the material world.

We saw in Chapter 1 that Descartes developed his comprehensive new theory during 1629–33, as he composed his *World*. This period began with the "metaphysical turn" of 1629–30, during which he claimed to discover the foundations of physics while contemplating God and the soul (1:144). We can appreciate this claim by comparing two strategies Descartes used to justify his new physics: empirical and metaphysical. In presenting portions of his new physics in the *Discourse* and essays, he offered no metaphysical justification for its basic principles. He put forward as a hypothesis that bodies are composed of particles having only the properties of size, shape, position, and motion. The *Discourse* argues that this corpuscularian hypothesis is confirmed through

the many types of effect it can explain (6:76). It offers an empirical argument from explanatory unity in support of the new physics.

Descartes also promised a metaphysical demonstration for the basic principles of his physics (6:76). In letters from 1638, he elaborated the empirical argument but refused to reveal the metaphysical demonstration (1:563–64, 2:199–200). He mentioned both types of argument to the French mathematician J. B. Morin, comparing his explanations with those of the Aristotelians:

> Compare my assumptions with the assumptions of others. Compare all their *real qualities*, their *substantial forms*, their *elements*, and similar things, of which the number is nearly infinite, with the single assumption that all bodies are composed of parts. This is something that is visible to the naked eye in many cases and can be proved by countless reasons in others. As for what I add, namely, that the parts of certain kinds of bodies are of one shape rather than another, this is easy to demonstrate to those who acknowledge that bodies are composed of parts. Finally, compare what I have deduced from my assumptions – about vision, salt, winds, clouds, snow, thunder, the rainbow, and similar things – with what the others have derived from their assumptions on the same topics. I hope that this will be enough to convince anyone who is not overly biased that the effects that I explain have no other causes than the ones from which I have deduced them. Even so, I intend to demonstrate that in another place.
>
> (2:200)

On some occasions, Descartes does not explicitly reject Aristotelian forms and qualities but merely says that, in his physics, they are not needed (3:492; *Meteorology*, 6:239). Here, he claims that his argument from comparative simplicity and unity of explanation should convince an unbiased mind that various natural phenomena "have no other causes" than particles of various shapes – that is, that they do not have as causes substantial forms and real qualities. This argument would not convince an Aristotelian who doubted whether Descartes' explanations really were more successful overall. Recognizing that the argument was not a

strict demonstration, he continued to speak of a metaphysical demonstration, which became the *Meditations*.

FOUNDATIONS FOR PHYSICS

Our reading of the *Meditations* can help interpret a further clue from 1638 regarding how contemplation of God and the soul might yield foundations for physics. In letters to Mersenne and the Jesuit Vatier, Descartes explained that he withheld the metaphysical demonstration from the *Discourse* in order to avoid introducing radical skepticism into a popular work. Presenting the metaphysical foundations required the use of skepticism so that readers might "withdraw the mind from the senses" (1:350–51, 560). In Meditation 5, Descartes offered pure intellect, devoid of sensory content, as the instrument for knowing not only the soul and God but also the essence of material things. This same instrument supported his claim (Med. 3) that God conserves matter in existence from moment to moment.

On this interpretation, the metaphysical turn toward the pure intellect provided Descartes with a direct perception of the core principles of his physics. Let us put this reading to work, considering first the foundations of Descartes' physics of the material world and then his physics of mind–body union and interaction.

REAL QUALITIES, EXTENSION AS ESSENCE

Descartes' denial of real qualities may not seem radical now. Everyone acquainted with basic physics or introductory psychology knows the modern analysis of color perception, which explains color in objects using wavelengths of light (a distant relative of Descartes' spinning particles). But to Aristotelians and others in his audience, the denial of real qualities would have seemed particularly difficult to accept. Let us put ourselves in their shoes to see why.

In an Aristotelian account, an experienced sensory quality is a direct representative, or instance, of a quality in the object. In seeing a red tulip, the "real quality" of redness is transmitted to our senses and received in the sensory soul as a "form without

matter." The form of redness makes the tulip red; this same form is expressed in the red we experience phenomenally, in accordance with Aristotle's principle that like knows like. In between, it is transmitted "without matter" through the air, into the eye, and down the optic nerve (conceived as a hollow tube).

The Aristotelian account has commonsense appeal because it says that our visual experience reveals the actual or "real" qualities of things. However, in Aristotle's writings the account was incomplete. The notion of a form without matter transmitted into the eye had to be elaborated by medieval and early modern Aristotelians. If the form makes the object red, why doesn't it turn the intervening air red when transmitted through it? But the air between the tulip and us does not appear red; nor does the eye turn red when we see a red thing. To explain these facts, mainstream scholastic Aristotelians taught that the form in the medium and in the eye has a diminished existence, called "intentional being"; they termed the transmitted form an "intentional species." The technical term "intentional" conveyed two things: first, that the species of color "tends toward," "points to," or "represents" the color in the object; and, second, that because the species of color in the air has diminished being, it does not turn the air red. In this way, they sought to square Aristotelian doctrine with observed facts.

In the *Dioptrics*, Descartes boasted that he could avoid the "intentional species that exercise the imagination of the philosophers" (6:85). In his account, everything in the sensory process (up to mind–body interaction) is purely mechanical. The quality of red in the object, the transmission of light and color, and the effect of light and color on the nervous system all reduce to the size, shape, and motion of particles. Color in the object consists in the geometrical features of its surface, which put one or another spin on spherical particles of light. When transmitted to the eye, the spin affects the retinal nerves one way if the object is blue and another way if it is red (6:91–92). These effects in the nervous system and brain then cause differing sensations in the soul. Descartes did not deny that objects are colored; rather, he denied that color is a real quality as envisioned by the Aristotelians. Color in objects is a purely mechanical property that affects the

nervous system, causing a sensation of red. The experienced red – the phenomenal content of the sensation – has a lawful relation (established by God or nature) with the brain state that causes it and hence with the surface of the object (6:130–31, 7:81).

As Descartes saw it, he needed to overcome a ubiquitous human prejudice in favor of the resemblance thesis (discussed in Chs. 5 and 8) to gain acceptance for his theory. His initial reason for doubting that experiences of color and other qualities resemble something in the object is that these sensory contents are "obscure and confused" (7:43, 80, 83). To understand this objection, we must ask: obscure and confused by comparison with what? In the sensory perception of a red ball, our experience of the ball's redness does not seem any more or less confused than our experience of its roundness. Both are equally "in focus," phenomenally speaking. We need to find another standard (besides bare phenomenal experience), comparison with which renders our perception of color obscure and confused and our perception of shape not.

Meditations 3–5 provide the needed standard. Descartes might argue that sensory ideas of color are obscure and confused by comparison with a clear and distinct (purely intellectual) perception of shape. Meditation 3 relates that color and other qualities are thought of "in a very confused and obscure way, to the extent that I do not know whether they are true or false, that is, whether the ideas I have of them are ideas of actual things or of non-things" (7:43; see also 7:83). By contrast, intellectual perception of extension and its modes in Meditation 5 reveals that material things "are capable of existing, insofar as they are the subject matter of pure mathematics, since I perceive them clearly and distinctly" (7:71). Shape and other geometrical modes are clearly perceived to be potential properties of any possible material thing, but color is not.

An argument for excluding real qualities might go as follows. Extension is the essence of matter. My sensory ideas of shape, size, position, and motion therefore present properties that things can have. I sometimes am mistaken about the precise sizes and shapes of existing things, but the economy of the senses as bestowed by God ensures that I am often right. By contrast, I do not clearly and distinctly perceive phenomenal color to be a possible property

of objects. Ideas of color arise only from the senses, but I should use only clear and distinct intellectual perceptions to discern what properties things can have. Sensory ideas of color do not meet that standard. Hence, bodies do not have the "real quality" color.

However, if we are to square this reading with the theory of ideas from Chapter 5, we must assign some objective reality to the phenomenal red content of our sensory ideas. All ideas are "as it were of things" (7:44). But what is phenomenal red an idea of? It is so obscure that, prior to obtaining the true metaphysics, we might think it represents the real quality of red in the object. This thesis is now ruled out by our understanding that matter has only the geometrical modes of extension. Hence, inasmuch as there is some truth even to the obscure and confused sensory idea of red, the idea should represent something that exists in the object and regularly causes the experience of red (see 7:44, 80–81). These constraints are met if the idea of red is a confused and obscure presentation of the surface features of objects that spin light particles so as to produce red sensations in perceivers. Phenomenal red is simply what it's like to obscurely perceive one type of surface texture; phenomenal blue is the obscure perception of a different surface texture, and so on. This reading also interprets material falsity (7:43–44). The presentation of the surface texture is so obscure that, lacking the right metaphysics of matter, we can't tell whether the resemblance thesis is true. Hence, before gaining that metaphysics, we may be tempted to suppose that the manifest phenomenal quality of red represents a real quality – phenomenal red offers material for error. Once we have the right metaphysics, we see that phenomenal red actually must be an obscure perception of a surface texture.

This argument draws heavily on the perception of the essence of matter (Med. 5), which opens it to an objection. It can be interpreted as an argument from ignorance. Perhaps color is a real quality of matter, and the human intellect simply fails to perceive it as such. In fact, Descartes refused to assert that we know "each and every property" in mind or matter (7:220). Maybe we simply can't say whether color is a real quality or not.

This raises a question of interpretation. Does Descartes claim to perceive that color *is not* a possible mode of extension, or merely

not claim to perceive that it is a mode? Does our intellectual perception exclude the real quality from matter or is the status of color simply unknown?

We have seen good evidence that Descartes wanted to exclude real qualities from bodies. If his argument rests entirely on a direct intellectual perception that phenomenal color is not a possible mode of extended substance, discussion ends there. The exclusion rests on an intellectual perception of matter's essence, pure and simple. This one-step argument offers little aid if we haven't already had the same metaphysical insight ourselves. However, the constitutive-essence principle (Ch. 8), according to which all modes of a substance must be understood through its principal attribute, might shore up the argument. If we treat extension as the intelligible object of geometry (as instructed), then it has no color or other sensory qualities. It possesses only extension, divisible into parts having size, shape, position, and motion (7:63–64, 73–74). In trying to think of color as a mode of extension, we find only obscurity and confusion. Indeed, in the *Principles* Descartes observed that "we cannot find any intelligible resemblance between the color which we suppose to be in objects and that which we experience in our sensation" (8A:34).

In Part 2 of the *Principles*, Descartes repeated the point from Meditation 6 that the senses are not for showing "what really exists in things" but for informing us of what is beneficial or harmful to the mind–body complex (8A:41). To know what really exists in things, we must "lay aside the preconceived opinions acquired from the senses, and here make use of the intellect alone, carefully attending to the ideas implanted in it by nature" (8A:42). He continued:

> If we do this, we will perceive that the nature of matter, or body considered in general, consists not in its being something that is hard or heavy or colored, or that affects the senses in any other way, but simply in its being something that is extended in length, breadth, and depth.

If we never felt any bodies, hence never felt them to be hard, bodies would not "lose their bodily nature." He extended this thought experiment to the other merely sensory qualities:

> And by the same reasoning it can be shown that weight, color, and all other such qualities that are perceived by the senses as being in corporeal matter, can be removed from it, while the matter itself remains intact; it thus follows that its nature does not depend on any of these qualities. (8A:42)

As in the argument for mind–body distinctness (Med. 6), Descartes claims to perceive body as a complete being (something that can exist as it is) while denying it the phenomenal quality of color. It is not that he simply doesn't think about whether color is in body. He asserts that it is not. If matter can be a complete being without color, and if the properties that things have on their own must be instances of their essence, then here is an argument for excluding color. This argument is not explicit in the *Meditations* but may be latent in the perception of the essence of matter (Med. 5) and the discussion of the respective roles of the senses and intellect in knowledge of bodies (Med. 6).

Descartes drew other conclusions from his theory that extension is the essence of matter. Famously, he inferred that there can be no space distinct from matter, hence that a vacuum is impossible and the universe a plenum (8A:49). There is only matter in motion. Motion does considerable work in Descartes' physics. Let us turn to the laws governing it.

IMMUTABILITY, LAWS OF MOTION

In Descartes' metaphysical terminology, motion is a mode of extension. But extension, as the essence of matter, does not specify what laws, if any, matter in motion must follow, or what happens when moving bodies collide. Two extended things cannot interpenetrate or coexist in the same place, so in a collision something must give. But the bare concept of extension prescribes no specific outcome. Descartes' extended matter does not possess Newtonian mass, with its implications for momentum and transfer of force on impact.

Descartes conceived extended matter as intrinsically inert. It contains no activity and accrues no force by being in motion. All force and activity must be ascribed to God, who conserves matter in existence from moment to moment.

The Third Meditation does not mention laws of motion but provides the foundation for such laws in God's conserving action. The laws themselves are set out in the *World* and *Principles*. God conserves the motions of bodies in accordance with laws governing their interactions on impact (excluding action at a distance). Both works portray the universe as evolving out of a soup of particles, created by God with a certain quantity of motion (11:32–35, 8A:101; see also 6:42–44). This "quantity" is the product of the speed of a body and its volume. (Descartes did not allow for matter of differing specific gravities; he explained the density in ordinary objects by hypothesizing that some are more porous than others.) Speed is a scalar quantity – change in direction does not alter the quantity of motion. Descartes derived the laws of motion from God's immutability; God conserves the same quantity of motion from moment to moment.

Descartes purports to derive three laws from God's immutability. The first is "that each thing, as far as it is able, always continues in the same state; and so when it is once moved, it always continues to move" (8A:62*). Motion and rest are persisting states of things. The second is "that all motion, in and of itself, is along a straight line; and therefore, that which moves in a circle always tends to move away from the center of the circle it is describing" (8A:63*). These two laws are similar to Newton's law of inertia (his first law of motion) but differ in not treating motion as a vector quantity (so that changes in direction alter the quantity of motion). The third law is "that one body, in colliding with a stronger body, loses none of its own motion; but in colliding with a weaker body, it loses as much of its motion as it transfers to that weaker body" (8A:65*). This law is implausible on the face of it, for it specifies that a snooker ball could never move the slightly larger balls used in pool, no matter how hard it was driven. Descartes sought to avoid such counterexamples by contending that, in our matter-filled environment, the larger body is surrounded by the fluid of the air and so is easier to move (8A:70) – although presumably both bodies are surrounded in this way, negating any differential effect on ease of motion.

The source of natural rectilinear motion is God's conserving power: "he always conserves the motion precisely as it is at the

very moment when he conserves it, without taking any account of how it may have been a little earlier" (8A:63–64) This reveals another difference between Descartes' rectilinear persistence and Newtonian inertia. Newton's inertial law is explanatorily basic – a place where explanation stops. In Newtonian physics, the continued motion of bodies in a straight line requires no explanation. (Newton himself, for a time, regarded continuing motion as the product of an inertial force, but later Newtonians conceived of inertial motion as basic, without a continuing force.)

Although Descartes considered God's moment-to-moment conservation of material corpuscles in motion to be certified by his metaphysics, it has its problems. One might object that, in a single instant, a particle can have no tendency to move, since on Descartes' theory (8A:53) motion is simply transference from one location to another (requiring finite time). The soundness of this objection depends partly on whether Descartes conceived instants as vanishingly small or as dimensionless points. It may also depend on whether God keeps book on the "tendencies" or directions of particles in motion. If God recreates the universe from point-instant to point-instant, then a body's continuing motion in a direction would depend entirely on God's keeping track from moment to moment and not on any tendency internal to the body itself.

Another problem concerns the coherence of bodies. If bodies are composed of innumerable parts, how do they cohere to form a unit? Apparently, bodies form units because their parts are at rest relative to one another (8A:71). In a moving body, the common motion of its particles keeps them together. Any impact between macro-level bodies, such as a cue ball and eight ball, involves the surface-to-surface contact. The volume of the whole cue ball sets the quantity of motion (speed times volume) available to affect the eight ball. But the balls are units only because their particles move together. As the lead particles make contact, their motion should be changed relative to the rest of the ball, breaking the unity. Why shouldn't a collision result in the balls dissolving into one another, like colliding puffs of cigar smoke? Perhaps because, as Descartes says, particles with irregular shapes catch on one another and hold together (8A:144). But how can infinitely divisible matter hold any shape at all? Why

don't all the particles simply dissolve? Perhaps Descartes tacitly held that God conserves them as units.

Further, the laws do not define a determinate outcome for impact. The third law says that one body loses as much quantity of motion as another gains, but not how much each loses and gains. To provide greater specificity, Descartes offered seven rules of impact in the *Principles* (8A:67–70). Although allegedly following from the three laws, they are not strictly derivable. And, as Leibniz later observed, they yield discontinuities when the sizes and speeds of bodies are only slightly varied.

In practice, this last problem was of little consequence, for Descartes did not refer to the rules of impact again in the *Principles* and rarely mentioned the laws of motion (8A:108, 117, 144, 170, 194). The explanatory workhorse in Descartes' physics is the mechanistic interaction of particles in accordance with their shapes and motions. This picture requires such interactions to be regular, which is addressed by the laws. But in justifying his mechanistic models, Descartes appealed to analogies with observable corporeal processes, not to precisely calculated exchanges of quantity of motion. (The exception is his discussion of the laws of reflection and refraction.)

The significance of Descartes' laws of motion lies more in their conception than in any technical contribution to the analysis of impact. They offered the general vision of law-governed interactions of matter everywhere in the universe. The first and second laws described rectilinear motion as a natural state that does not diminish of itself and continues forever if unimpeded. Although Galileo is sometimes credited with a protoversion of Newtonian inertia, he treated circular motion along the surface of the Earth as "natural," not straight-line inertia. Although Descartes' conception did not involve vector quantities, it was the historical precursor to Newton's law of inertial motion. Newton's natural philosophy builds on and corrects Descartes'.

MATTER, INNATE IDEAS, AND ETERNAL TRUTHS

The essence of matter is extension as understood in geometry. The ideas of geometrical essences inhere (innately) in the human

intellect. Descartes asked concerning these essences: why are they as they are? That is, why is the essence of the circle what it is, the essence of the triangle what it is, and so on? And how does the mind obtain its innate ideas of those essences? The answers refer to the creative power of God.

As previously mentioned, Descartes held that the geometrical essences, as the essences of all created things, are free creations of God (1:145–46, 149–53; 7:380, 432, 435–36). God did not look to any standard or model, whether independent of or internal to himself, in creating the essences; he simply made it the case that the radii of a circle are all equal to one another and the angles of a triangle equal to two right angles. He could have created otherwise, so that the radii are not equal (1:152). Since our minds possess the truths as created, we may be unable to conceive such possibilities. (Descartes had no inkling of non-Euclidean geometry.) Nonetheless, he held, the mathematical essences (and other "eternal truths") are God's free creations.

This doctrine might seem to threaten human knowledge. What if God changed these truths? Nothing about the current set of essences required God to create them instead of others. If he reconsidered his act of creation, today's geometrical truth might be tomorrow's falsehood.

Descartes held that his doctrine actually secures human knowledge. Along with the eternal truths, God created the material world and various minds (with their respective essences) and implanted innate knowledge of those essences in human intellects. God adjusted the human intellect to the essence of matter (and mind). Since he is immutable, the threat of changing essences does not arise. His immutability makes the "eternal truths" eternal (1:149, 152).

In Descartes' context, this doctrine might have improved the theological palatability of his claiming to know the first principles of physics. In the metaphysical theology of mainstream scholastic Aristotelians, knowledge of the essences of things implied an understanding of the absolute limits on God's creative power. They held that the essences of created things, such as a rabbit or an oak tree, depend on God for their existence. But that did not imply that God freely chose the essences that things have. God could not create a rabbit that wasn't an animal or that otherwise

violated the essence of rabbithood. Essences are eternal because grounded in God's (eternally determined) creative power. God understands the essences by understanding what he can and cannot create. On this view, a natural philosopher claiming to know the essences of things – and especially claiming to know possible essences *a priori*, as did Descartes – would be claiming to have fundamental knowledge of God's power.

Descartes' doctrine that the eternal truths are free creations permits the natural philosopher to claim knowledge of essences without claiming to comprehend the structure or limits of God's creative power. Since it was a tenet of Catholic theology that God cannot be fully comprehended, Descartes hereby sidesteps theological problems that might otherwise accompany his claim to have a "complete" understanding of the essence of matter (7:121). The human mind's innate ideas are adjusted to the created world not because the human mind grasps the limits of God's power but because God has freely created the world with its essences and implanted ideas of them in our minds.

A MECHANICAL PHILOSOPHY

Descartes envisioned the world as a grand machine. This machine was not filled with cogs and gearwheels but with fluids and pressures, spinning particles, and bits of irregularly shaped matter interacting to produce the phenomena of nature. In the *Meditations*, this vision appears in the description of the human body as a machine (7:84; also 7:229–30). It was extensively developed in the *Principles* and posthumous *World*.

The terms "mechanism" and "mechanical" have several meanings that might fit the concept of a mechanical philosophy. Beyond the comparison with a machine (discussed below), the terms may imply the blind following of laws without the intervention of undetermined will or choice. In this sense, even a dualistic psychology can be mechanistic if soul substance is governed by laws. (Descartes proposed that the human will always chooses a clearly and distinctly perceived truth or good, exercising the freedom of indifference only when the intellect fails to present clear truth or goodness [7:432–33].) In Descartes' physics, both material nature

and mind–body interaction are governed by exceptionless regularities. His vision of nature was mechanistic in this first sense. But, unlike Newtonian physics, Descartes' natural philosophy is not filled with derivations from quantitative laws. His only published successes in fitting quantities to empirical phenomena are the sine law of refraction (6:101) and work on the rainbow (6:336–43).

Another aspect of a "mechanical" philosophy of nature is the banishment of active principles, vital forces, and action at a distance from natural processes. Descartes rejected the Aristotelian vegetative and sensitive souls and their relatives, previously thought to govern (with implicit intelligence) the organic processes of living things. Whereas many previous natural philosophers, including Gilbert and Kepler, accepted animistic theories of magnetic attraction, comparing it to the attraction between lovers, Descartes offered a purely mechanical theory of particles in motion. He reduced the heat of fire to particles in motion, the action of light to pressure in an ætherial medium, and so on. All material interaction is by direct contact.

"Mechanistic" can also mean nonpurposeful, or without a guiding teleology. Descartes famously banished final causes from physics because the human mind cannot hope to discern God's plan (5:158, 7:374–75, 8A:15–16, 80–81). He explicitly targeted the view that all nature has been organized for the benefit of humankind. Descartes' cosmos is populated by many suns with many planets; he felt it ludicrous for human beings to suppose that our Sun was created expressly for our benefit (3:431). He also rejected the Aristotelian view that earthy matter is guided by the end or final cause of moving toward the center. (But the common Aristotelian view attributed no awareness or knowledge to such matter, contrary to Descartes' caricature [7:442]).

However, Descartes did not banish all teleological thinking from natural philosophy. In describing the composite human being (mind and body), he spoke of God or nature having arranged the rules of mind–body interaction so that sensations tend toward the preservation of the composite being (hence toward the health of the body [7:80, 87]). This counts as invoking purpose, teleology, or final causes in analyzing the mind–body relation and the functioning of the senses. Similar teleology appears in his

physiology, where he spoke of the "functions" of the parts of the body or what they "serve" to do (7:374–75; 11:121, 153, 224).

A final sense of "mechanical" means machine-like or pertaining to machines. The basic notion of a machine in Descartes' time derived from ancient mechanics, which regarded the lever as a simple machine. Descartes invoked this notion in proclaiming of his philosophy that, "like mechanics, it considers shapes and sizes and motions" (1:420), and he composed a brief treatise on mechanics (1:435–47). But his philosophy was mechanical in a broader sense, in that he compared natural phenomena and animal bodies to complex machines with interacting parts. Many of Descartes' mechanical explanations take the form of analogies with effects observed in ordinary experience (8A:324–26). They use analogies to characterize micromechanisms, which in turn (purport to) explain known natural phenomena. Descartes explained the properties of water by comparing its particles to eels, the viscosity of oil by comparing its particles to branchy bushes that catch one another, like tumbleweeds (1:423), and magnetism through screw-shaped effluvia (8A:275). His grandest comparison was between the human body and the hydraulically driven automata found in the royal gardens of Europe (11:130–31). This comparison again evokes latent teleology, regarding the design or function of the parts of living machines.

MECHANIZED BODY, EMBODIED MIND

Descartes' mechanical philosophy rejected animism everywhere, save for the human body (joined with a mind or soul) and perhaps the world as a whole (where quantity of motion is conserved by God). To twentieth-century naturalism, this seemed like two animisms too many. Descartes was accused of putting a "ghost in the machine" of the human body.

Emphasizing Descartes' dualism can mask his facilitation of a naturalistic, antivitalistic materialism concerning living things. Aristotelians and other vitalists were "naturalists" inasmuch as they considered plants and animals to be part of nature and hence their powers and active principles to be natural. But by the standards of twentieth-century materialistic naturalism, their list

of natural powers was too liberal. On those standards, the vegetative and sensitive powers of the Aristotelians, as also Descartes' immaterial mind, were non-naturalistic. And yet, despite its dualism, Descartes' philosophy promoted a materialistic naturalism toward living things by holding that plants, animals, and the human body are nothing but machines. Indeed, he extended such naturalism to animal psychology generally and much of human psychology.

MACHINE MEN

The most complete description of Descartes' mechanistic physiology is the *Treatise on Man* (which explored the fictional case of a mindless human body), although aspects appear in the *Discourse*, *Dioptrics*, *Meditations*, *Principles*, and *Passions*. The basic vision is simple – human and animal bodies are machines that respond to their environments through sensory stimulation, seek food when they haven't eaten, form material memory traces, and learn in response to sensory stimulation. As he wrote in Meditation 6, one may consider the human body "as a kind of machine equipped with and made up of bones, nerves, muscles, veins, blood, and skin in such a way that, even if there were no mind in it, it would still retain all the same movements which in it now do not proceed from the command of the will nor, consequently, from the mind" (7:84). Since he denied minds to animals, all their behavior had to be accounted for mechanistically. Much human behavior could, he thought, be similarly explained (see 6:56–59).

Descartes thought of human and animal bodies as powered by a fire without light in the heart (8A:256, 11:202, 333). This fire heats and expands blood as it enters the heart, like a boiler in a steam engine. The blood exits the heart moving quickly, some proceeding to the brain. At the base of the brain, the "animal spirits" – the subtler and livelier parts of the blood – are filtered out and enter a central brain cavity through the pineal gland. (Descartes made this gland the locus of mind–body interaction because of its central location and its alleged uniqueness as undoubled and its ease of movement [3:19–20].) Some spirits proceed down the nerves (conceived as hollow tubes) to the

muscles, which they cause to inflate like a balloon, become taut, and contract. Muscle movement and hence behavior are determined by which tubules the spirits enter (11:129–43, 170–97).

A sensorimotor loop controls the spirits. Sensory nerves are filaments encased in the tubules. When a sense organ is stimulated the filament jiggles a certain way, opening the tubule in the central cavity, allowing spirits to flow toward a muscle. The pattern of spirits leaving the pineal gland reflects the pattern of stimulation of the nerves. In vision, the pattern on the retina is conveyed to the pineal gland (the images from two eyes merging to form one), where in minded humans a visual sensation arises (11:174–76). The material processes of sensation, which create outflowing animal spirits, can produce muscle movements in both humans and nonminded animals independently of mental guidance.

Which response occurs to a given stimulus is determined by several factors, some innate, some depending on memory and learning (11:192–93). Some plumbing is innately structured to produce a rapid response, as when in falling we extend our hand to protect our head (7:230). In other cases, a response depends on changes in tubule plumbing elicited by previous sensory stimulation, as when a dog (or human) learns to be ready for food when it hears the food bag rattle or sees the refrigerator door open. If the animal hasn't eaten, the lack of food enlivens the spirits and disperses them widely, causing it to rove about (11:195). If food is present, the pattern of stimulation causes the animal to approach and eat it. Similar processes occur in the human body, as the *Treatise* explains. Mindless automata are capable of many functions, both physiological and psychological, so as to produce situationally appropriate behavior (11:202).

Descartes' *Passions* also contended that purely physiological processes dispose the body to respond in many situations without mental intervention. In circumstances conducive to fear (a lion is present), the flow of spirits can cause a person not only to feel fear but also to run away, independently of thought or will:

> the mere fact that some spirits at the same time proceed to the nerves that serve to move the legs in flight causes another movement in the gland through which the soul feels and perceives that flight. In

> this way, the body can be moved to take flight solely by the disposition of the organs without any contribution from the soul.
>
> (11:358)

Just as a sheep (mindless automaton) flees the wolf simply through the motions of its spirits (7:230), a human being flees danger through a wholly mechanical process.

Still, Descartes sharply distinguished humans from other animals. When humans take flight, they are aware of doing so and may experience fear. On Descartes' theory, feeling, awareness, and sensation depend on the presence of an immaterial soul or mind. And yet, even our felt passions, caused in the mind by the body, are attuned to the body's mechanistic physiology and psychology. The function of the passions is to dispose the mind to continue the responses started by the body (11:359). By the time we feel fear, we should already be running through physiology alone. The feeling keeps us running. The mind can redirect our responses; we might override our running by recalling that lions chase moving prey but may overlook someone stationary. We cannot, however, simply choose not to feel fear. It takes cognitive effort, for instance, imagining the consequences of a behavior, to redirect the normal bodily response and diminish the feeling of fear (11:362–70).

LAWS OF MIND–BODY INTERACTION

Descartes developed a hybrid psychology in which some psychological functions are carried out by the body alone, some by the mind alone, and some through mind–body interaction. In correspondence with Elisabeth (Ch. 8), he avoided claiming to comprehend how mind and body causally interact and admitted that our knowledge of mind–body interaction is factual. In effect, he relegated study of mind–body interaction to empirical science.

The *Meditations* offers a basic principle of mind–body interaction, that "any given movement occurring in the part of the brain that immediately affects the mind produces just one sensation in it" (7:87). This is a principle of psychophysical lawfulness. It means that God has established a constant relation between brain states

and sensations (including internal sensations and passions). The *Dioptrics* invoked this principle as a natural "institution" (6:130*) relating various sensory nerves to kinds of sensation:

> regarding light and color ... we must think that our soul is of such a nature that what makes it have the sensation of light is the force of the movements that are found in the regions of the brain where the optic nerve-fibers originate, and what makes it have the sensation of color is the manner of these movements. Likewise, the movements in the nerves leading to the ears make the soul hear sounds; those in the nerves of the tongue make it taste flavors; and, in general, movements in the nerves anywhere in the body make the soul feel titillation when they are moderate and pain when they are too violent.
>
> (6:130–31)

One sort of jiggle (or pulse in the spirits) in one place yields phenomenal color, another yields a sensation of sound, and so on. Descartes posited several such psychophysical, or psychophysiological, correspondences. These included, for vision, not only light and color but also direct mechanisms for producing an experience of visual direction and, based on the accommodation and convergence of the eyes, an experience of distance (6:137–38, 11:183).

In these cases, none of the properties of spirit flow are "carried over" into the content of the sensation. One sort of vibration causes pain to be felt; another sort, titillation; another sort, red or blue sensations; another, the experience of distance. The mind experiences these qualities but does not experience the actual motions in the brain. The qualities it experiences are simply a matter of psychophysiological law, presumably arranged so that our sensory experiences differentiate objects in a useful manner.

In the case of shape perception, however, Descartes described another sort of relation between brain state and sensory content. In the sensory perception of shape, the pattern in the brain may possess the shape as presented in sensation. He held that in vision a point-for-point copy of the retinal image is produced on the

surface of the pineal gland. This shape enters sensation in the "second grade" of sense (7:437, Sixth Replies), which is the first mental response to the material nerve processes (these processes being the first grade of sense). The sensation presents a pattern of "color and light"; indeed, it includes the "extension of this color and its boundaries, together with its position in relation to the parts of the brain" (7:437). (As discussed in the next subsection, these immediate sensations may be overlooked after initiating a judgment.)

The problem of mind–body interaction concerns this second grade of sense, as a brain-produced sensation. We are focusing on the special case in which there is a match between shapes on the pineal gland and shapes in the pattern of color sensations. We saw (Ch. 8) that the language of the Sixth Meditation (7:73) suggests an inspection model – the mind "inspects" and "considers" the pineal image. In the just-quoted passage, the mind is said to consider a colored image in relation to the interior brain surface – very odd, since color experience arises only in sensation (the mind would be comparing a sensation directly with the inside of the brain). Leaving this aspect aside, these passages suggest that, somehow, the shape of the brain pattern provides the content of the imagined or (second-grade) sensed shape. And yet the notion that the mind literally looks at or inspects the brain is unsatisfactory, for it invokes, in seeing or looking, one of the capacities that the entire account is intended to explain (see also 6:130).

The Fifth Replies offer a way of avoiding the inspection model while codifying a second principle of mind–body interaction for the sensation or perception of shape. There, Descartes uses the term "corporeal species" and explains that in his theory (as opposed to an Aristotelian one) the mind uses the body to produce the content of sensation or imagination without "absorbing" a species or form:

> you ask how I think that I, an unextended subject, could receive the species or idea of a body, which is extended. I answer that the mind does not receive any corporeal species; the pure understanding both of corporeal and incorporeal things occurs without any corporeal species. As for imagination, however, which can only be of corporeal

> things, it indeed does require a species that is a real body; the mind applies itself to this species, but it is not received into the mind.
>
> (7:387*)

The mind does not understand extension "by means of an extended species," but it does "imagine extension by turning to a corporeal species that is extended" (7:389*). Descartes' corporeal species – in a way acting like Aristotelian intentional species – provide content to imagination and sense perception. But in accordance with the mind–body distinction, the mind cannot accept extended species into itself. Such species are like the corporeal images of the Second Replies and "give form to the mind itself, when it turns toward that part of the brain" (7:161). In the case of shape, these species provide shape content by being an instance of the shape in question. However, they are not looked at; rather, they serve to produce in the mind a mental presentation of the shape in question. In other cases, brain states produce sensations of color, odor, or visual direction, without any similarity between brain state and represented content.

The appeal to corporeal or material species avoids the implication of the inspection model that the mind actually sees the small corpuscles of animal spirits pulsing out of the pineal gland. But such species still require that God "institute" a rule relating spirit flow to experience. This rule must account for the fact that only the shape of the pineal pattern "informs" the mind so as to produce a shape sensation; the pulsing of the flow does not produce a sensation of pulsing but instead a sensation of light and color (for vision). Other sensory modalities, such as smell, presumably also yield a shaped pattern on the pineal gland (even if only one particle wide); in such cases, the mind does not experience the shape but only an odor.

The notion of empirically discoverable mind–body relations does not require substance dualism but is not precluded by dualism, either. In any case, the notion itself has outlived the widespread acceptance of such dualism. In the nineteenth century, Gustav Fechner transformed it into the science of psychophysics, an area of successful quantitative measurement in the new experimental psychology. The question of the relation between

shaped patterns in the brain and the contents of sensory experience also lives on, in discussions of mind–brain isomorphism.

DESCARTES' PSYCHOLOGY OF VISUAL PERCEPTION

Descartes' theory of visual spatial perception is among the more successful aspects of his natural philosophy. In some ways, he adapted the traditional theoretical apparatus, which went back to Ibn al-Haytham. But he also advanced novel accounts of the perception of direction and distance.

In the traditional theory, the eye receives a two-dimensional pattern corresponding to a perspective image. (The theory of *where* this pattern occurs in the eye changed with Kepler's discovery of the retinal image, but not the characteristics of the pattern itself.) The sensory faculty then adds the third dimension through judgment. Descartes' three grades of sense in the Sixth Replies incorporate this theory. Starting from a two-dimensional sensation (second grade), the mind adds distance, size, and shape (in three dimensions): "size, distance, and shape can be perceived only by reasoning from one of these features to the others" (7:438). As explained in the *Dioptrics*, the retinal and pineal images, and hence the sensation, might "contain only ovals and rhombuses when they make us see circles and squares" (6:140–41), an instance of the modern psychological principle of shape constancy. (See also 6:140, for size constancy.) Descartes calls the act by which the mind makes us see objects at a distance, and as circles rather than ovals, a "calculation and judgment" (7:438). It occurs rapidly and habitually and so goes unnoticed (and so is assigned to "sense" rather than intellect, constituting the third grade of sense).

The *Dioptrics*, while including the traditional theory, offers a novel account of the perception of visual direction and distance. At the basis of this new theory is the supposition that variations in brain state correspond to the operation of the ocular muscles. When the muscles contract so as to point the eyes in a certain direction, there is a change in "the tiny parts of the brain where the nerves originate" (6:134), which causes the mind to experience the direction of the eye and hence the directions of points in

the world that send light to the eye. I say the mind is "caused" to experience the direction because Descartes does not envision a cognitive process by which the mind calculates the direction. Rather, variations in brain states directly and immediately cause experiences of various directions. Similarly, Descartes was aware (as a consequence of Kepler's discovery) that the eye must adjust its focal properties in order to see objects clearly at one distance or another. This change, called the accommodation of the eye for distance, is effected by ocular muscles. Again, he posited that "as we adjust the shape of the eye in proportion to the distance of objects, we also change a certain part of our brain in a manner that is instituted by nature to make our soul perceive this distance" (6:137*). This happens without our reflecting on it. It is another instance of an immediate psychophysiological relation, in which a brain state directly causes an experience of depth or distance. In terms of the Sixth Replies, these accounts of perceiving direction and distance belong to the second grade of sense, reconceived to include direction and distance as immediate sensory responses.

This novel aspect of Descartes' theory has frequently been misunderstood. For instance, George Berkeley, in his *New Theory of Vision*, interprets Descartes as ascribing all distance perception to calculation and judgment.

ROLE OF EXPERIENCE, EXPERIMENT

The *Meditations* sets a standard of certainty that apparently can be met only by the clear and distinct perceptions of the intellect. The *cogito* reasoning, the perception of the essences of mind and matter, and the proofs for the existence of God and of external objects allegedly meet that standard. Even after external objects are regained in the Sixth Meditation, sense perception of particular properties of things is subject to "doubt and uncertainty" (7:80). Yet Descartes recognized the need for sensory observation and appeals to experience in investigating nature (6:64–65, 7:86, 87, 8A:101, 319).

The lowered degree of certainty associated with the senses together with the need for observation and experiment in natural

philosophy creates a tension in Descartes' epistemology. If experience is needed for physics but offers less certainty, it seems that Descartes must either exclude the experience-based parts of physics from legitimate knowledge or accept less certainty.

Descartes used experience to support his physics in two ways. First, before publishing the *Meditations*, he offered an empirical argument for the fundamental principles of his physics (matter in motion). Second, in that period and later, he acknowledged that even with the full foundations for physics in place (including metaphysical support for the laws of motion), hypotheses about the particular mechanisms used to explain various natural phenomena remain underdetermined (6:63–65, 8A:101). Granting his basic principles, more than one mechanism might still explain magnetism, or the properties of salt, or the instinctual behaviors of animals. Observation and experiment are needed to decide which mechanisms actually occur in the world.

Before and after the *Meditations*, Descartes affirmed that decisions about which mechanisms exist, even if based on observation, can yield "demonstrative" knowledge (2:141–42, 198; 8A:327–28). But the standard of certainty for such demonstrations was reduced. In the *Principles*, he averred that, while his metaphysical foundations attained "absolute certainty," his more particular claims might achieve only "moral certainty" (8A:328–29) – that is, "sufficient certainty for the needs of everyday life" (8A:327). The laws of motion, the essence of matter as extension, and the denial of a vacuum were intended to achieve absolute certainty. But specific micromechanisms achieved only moral certainty – or perhaps "more than moral" but not absolute certainty for specific mechanisms (8A:328).

Descartes compared the grounds for believing his hypotheses to those for cracking a code (8A:327–28). If a proposed solution to a code makes sense of numerous messages, it is accepted, even granting that another (unknown) solution might also work. Similarly, if a proposed explanation for magnetism or another natural phenomenon accounts for everything, it is accepted as true, even if other (unthought of) explanations are not ruled out. In these cases, we should simply accept the "all things considered" best theory.

In cracking the code of nature, Descartes offered a big head start. His metaphysical foundations were to limit dramatically the domain of possible solutions. Only geometrical modes may be attributed to bodies. Active powers, real qualities, and other active principles have been excluded. He intended his metaphysics to provide a permanent framework for all future science.

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10

LEGACY AND CONTRIBUTION

Estimates of the enduring value of Descartes' philosophy vary widely. Some major thinkers of the twentieth century, as diverse as Edmund Husserl and Noam Chomsky, happily aligned themselves with Descartes in some way. Others portray Descartes as responsible for grave philosophical errors that sent the tradition of Western philosophy (R. Rorty) – or some portion of it, such as the philosophy of mind (Ryle, Searle) – in the wrong direction. Still others accuse Descartes of denying emotions and the body and promoting an overrationalized conception of the human being (Bordo, Damasio) or of overrationalizing the visual sense by regarding it as an exercise in geometrical reason (Crary).

Faced with grand claims about Descartes' virtues or vices, there are several questions to ask. First, who is the Descartes being praised or blamed? Is it the Descartes we've met through study of his writings, or a Descartes whose image has been more recently constructed? And, with the literary historian Michael Moriarty, we may ask whether his critics have actually studied Descartes or have absorbed an image of his thought at second hand.

With our firsthand knowledge, we are ready to consider Descartes' legacy and contribution, focusing on epistemology, science, and metaphysics. His legacy includes all effects on subsequent thought, good and bad. His contribution is what has once been or is currently valuable. Where problems he set remain open, the problems are his contribution.

PHILOSOPHICAL PROBLEMS: EPISTEMOLOGICAL AND METAPHYSICAL

Both Descartes' methods and his specific theories set problems for subsequent philosophy, including his skeptical doubt, *cogito* reasoning, proofs for God's existence, theory of sensory qualities, and mind–body distinction.

KNOWLEDGE AND METHOD

Descartes contributed two methods: the method of doubt and of clear and distinct perception. He linked them through an extant methodological idea, the analytic method, which aims to discover simple and fundamental truths that underlie all other knowledge. These simple truths may be embedded in complex judgments or ideas and need ferreting out, as we saw with the *cogito* reasoning. In that case, Descartes participated in an early form of what has come to be known as "analytic philosophy," insofar as such philosophy seeks to clarify concepts through analysis.

Descartes held that the elements of knowledge exist in the human mind as innate ideas (or innate capacities for sense-independent thought) that are recognized when and if experienced. The flood of sense perceptions initially prevents such experience. The method of doubt aids withdrawal from sensory experience to find purely intellectual ideas. The method of clear and distinct perception says that these purely intellectual ideas, which can be recognized because they compel the will's assent, are true.

Subsequent rationalist philosophers, including Spinoza, Malebranche, and Leibniz, appealed to such intellectual intuitions to support their metaphysical conclusions, but only Malebranche endorsed the method of doubt. All three held that the pure

intellect reveals the one true theory of the natures of things, yet each proposed a different substantive metaphysics. Eventually, these disparate results made it seem either that rational intuition does not exist or that it cannot reveal the one true metaphysics. Locke and Hume (among others) argued that human beings have no rational intuitions of substantive metaphysical truths. Kant examined the cognitive structure of the human mind and concluded that it cannot rationally intuit the real essences of things, effectively ending the rationalist metaphysical epistemology of pure intellect.

This did not, however, end the influence of Descartes' method of rational intuition, which lives on in the phenomenological tradition and was especially manifest in Husserl's *Cartesian Meditations* and Jean-Paul Sartre's reflective consciousness in *Being and Nothingness*.

PROBLEM OF THE EXTERNAL WORLD; DIRECT REALISM

Descartes' skeptical doubts (Med. 1) leave the meditator alone in her thought world (Med. 2). Many subsequent philosophers have wondered how a knower can transcend his or her thoughts to know the existence and properties of an external world. In this way, Descartes' *Meditations* engendered a problem of the external world.

This problem became acute in eighteenth-century philosophy and lived on in the sense-data philosophies of the twentieth century. Hume, in the *Enquiry Concerning Human Understanding*, used a method of doubt in seeking the limits of knowledge, concluding that certainty extends only to abstract mathematics (not applied to the world) and to the present contents of perception. All mental content arises from internal feelings and sensory perception. A similar position was adopted in the twentieth century under the name of sense-data theory, which is often characterized as Descartes' legacy (see References and further reading). Here, a method he introduced eventually led to an opposing position, that sensory experience provides the only certain knowledge. Descartes himself claimed to transcend sensory experience

through intellectual ideas so as to know the essence and existence of an external world. He did not give epistemic primacy to sense experience – which he thought should be trusted only in limited ways – but to pure intellect.

The image of the meditator confronting her own thoughts and the assimilation of Descartes to sense-data theory abets further problematic claims: that he considered individual thoughts to be incorrigibly (unmistakably) known and that he viewed the mind as completely transparent (if we have a thought, we know that we do). These notions portray a kind of mythical "Cartesian mind" that serves as stalking horse and target in recent discussions. In fact, Descartes did not claim that one incorrigibly knows the character of one's thoughts or notices every thought in the mind. He allowed that knowers can be mistaken about whether their beliefs are clear and distinct, prior to using his method of doubt to discover the pure intellect (Chs. 6–8). And some sensory ideas are so obscure that we aren't sure of their content (Chs. 5, 9). Further, some mental operations occur so rapidly that they go unnoticed (Ch. 9). Moreover, although in some sense Descartes held that all thoughts are conscious, he distinguished between those that are reflexively noticed and remembered and those that pass through the mind without being noticed. The claim that he made sensory ideas the incorrigible basis for knowledge is, then, doubly in error, for he neither treated sensory ideas as epistemic bedrock nor affirmed that they are known with maximum clarity and certainty.

There is ongoing controversy about how Cartesian ideas present the external world to a knower. The most popular interpretation is that sensory ideas are objects of perception in their own right, from which an external world is inferred via God's nondeceptiveness. (This accords with assimilating him to sense-data theory.) From the fact that we have a sensory idea with a spherical, red character, we infer that a red apple is present externally, a position called *representative realism*. Thomas Reid held Descartes responsible for the spread of this position, leading to skeptical ruin in Hume.

A less popular interpretation, offered herein (without explicit labeling until now), is that Descartes endorsed a kind of

epistemological *direct realism*. Chapter 5 interpreted Descartes as holding that all ideas are "as it were of things." On a direct realist reading, Descartes is saying that our ideas are not primarily the objects that we perceive; rather, the content of our ideas is the vehicle by which we perceive objects. (This interpretation does not preclude our being reflectively aware of the content of our sensory ideas – in that way taking them as objects.) We perceive material things as existing outside us, either possibly (for merely contemplated objects) or actually (in sense perception). The argument for the existence of the external world and the reliability of the senses (Med. 6) establishes that our sense experience normally is a direct perception of objects. The interpretation of material falsity offered in Chapter 9 allows that, even with color sensations, the mind is directly, if obscurely, perceiving the surface texture of an external thing.

This ongoing interpretive dispute is part of Descartes' contribution, forcing interpreters to elaborate their understanding of representative and direct realisms.

THE *COGITO* REASONING

The most famous argument in philosophy is Descartes' *cogito, ergo sum*. Although something similar is found earlier in Augustine of Hippo, Descartes' version has attained world-historical prominence.

The transition from one's thought to one's existence is unassailable, at least under a sufficiently modest conception of what is thereby known of one's existence. The *cogito* reasoning demands assent. The interesting part is to decide what exactly it proves.

In Chapter 5, we examined Descartes' use of the *cogito* to argue for the general reliability of clear and distinct perception as a truth presenter. The extraction argument as presented is logically valid. But since we now find Descartes' metaphysical results to be faulty, we can well doubt its soundness. In retrospect, the argument overgeneralizes from a single case. The assumption that the *cogito* reasoning exemplifies a general method of clear and distinct perception that can yield substantive metaphysical truths concerning God and the essences of mind and matter must be abandoned. The initial *cogito* conclusion extends only to the immediately

available contents of experience and cannot sustain an *a priori* metaphysics.

The enlarged *cogito* conclusion (Ch. 4), that I am a thing that doubts, understands, affirms, denies, is willing or unwilling, imagines, and has sensory perceptions, engendered a new attitude toward the mental and the contents of consciousness. By isolating the domain of thought, it drew attention to the fact that sensing, imagining, feeling, desiring, and deciding all have (or can have) conscious aspects. Aristotelian theories of sense perception did not require that all acts of sense perception be accessible to a central awareness. The eye might be said to judge light and color and the faculty of judgment to operate outside our notice in combining angular size and distance to yield true size (as in Ibn al-Haytham's theory). Earlier theorists did not require, as would Descartes, that all cognitive acts be in principle accessible to consciousness. Although Descartes did not take the empirically ludicrous stand that we are reflectively aware of, or notice, all our mental acts (5:220–21, 7:438), he did formulate the metaphysically bold thesis that every truly mental act is conscious and hence in principle capable of being noticed (7:246). We return to this issue in considering the essence of mind and the later acceptance of nonconscious thought.

Descartes' *cogito* reasoning received critical scrutiny from Kant, Husserl, and Sartre. The latter two especially built on a close engagement with and response to Descartes' presumed position, while considering the structure of consciousness and the relation between thought and being.

GOD AND REASON

From the time of Plato and Aristotle, philosophers have advanced arguments to prove the existence and attributes of a divine being. With the early medieval marriage of Greek philosophy and Christian theology, the project of giving a rational proof for the existence and attributes of God became a mainstay of Christian thought.

Metaphysical theology promoted a deep strain of rationalism in later medieval European thought. Within philosophy, some

proposed that the existence and attributes of God should be investigated on rational grounds alone, without appealing to scripture or divine inspiration. Pursuit of rational demonstrations concerning God fostered a rational attitude toward the deity, focusing on attributes such as infinity and perfection. The resulting conception is sometimes called "the God of the philosophers."

This rationalization of God, which was only partial in theologians such as Aquinas and Scotus and was further developed by Descartes and others, elevated the place of reason in human affairs. If God was subjected to reason in order to prove his (or its) existence, then reason could also note the limitations or lack of success of those proofs. Descartes' close contemporaries, Hobbes and Spinoza, applied reason to scripture. If scripture's authority was discounted, reason became the only evidentiary ground for belief in God. There resulted a deistic conception of God as first cause and rational orderer of the universe, who (or which) does not intervene in human history.

Descartes did not endorse a rationalistic approach to religion proper, for he acknowledged the light of grace (3:425–26, 7:148) and the authority of scripture (2:347–48, 7:2). But he limited philosophical claims about God to those founded in reason, helping instigate the "early Enlightenment" by teaching that individuals should evaluate fundamental philosophical claims for themselves (9B:3). He distinguished rational proofs for God's existence, appealing to no authority but reason, from doctrines founded on revelation and subject to theological authority (1:143–44, 8B:353).

PRIMARY AND SECONDARY QUALITIES

Descartes advanced the position that color and other sensory qualities do not manifestly reveal the basic physical properties of things. This position was canonized by Boyle and Locke as the distinction between primary and secondary qualities in bodies. Primary qualities coincide with the basic categories of physics – for Descartes, extension, size, shape, position, and motion. The secondary qualities depend on the primary qualities and are classed according to the sensations they cause in perceivers. Thus, bodies

with a surface texture causing light particles to spin so as to produce a certain color sensation in a perceiver possess that color as a secondary quality. As interpreted herein, the color sensation is an idea of the secondary quality as found in an external body, even though, phenomenally, the idea of red does not seem to be an idea of a surface texture (Ch. 9). Through an institution of nature, we experience one surface texture through experiencing phenomenal red, another through phenomenal blue.

The position of Descartes, Locke, and others is sometimes mistakenly paraphrased as saying that bodies are not really colored. Neither author denied (physical) color to bodies. They denied color in bodies as an Aristotelian real quality that our phenomenal experience resembles. A color sensation tells us that there is a certain physical property in bodies (its physical color) but doesn't reveal the physical details. Accordingly, color, light, sound, and other secondary qualities are perceiver-dependent properties of objects. Bodies would reflect light in the absence of perceivers, but they are classified as having color only because they affect light so as to cause sensations of color in perceivers.

Descartes correctly realized that, even if experienced qualities do not make manifest the fundamental physical properties of matter, they can be useful guides to the environment. Perceivers can tell objects apart because the same objects regularly produce the same color sensations. Recent research suggests that color perception evolved to allow animals to receive mating signals, to find food, and to make other biologically salient discriminations. Descartes' functional attitude toward the sensory qualities was on the right track.

SCIENCE AND METAPHYSICS

Prior to the rise of the new science, the extant natural philosophy ascribed various active principles to bodies, often understood through a biological analogy of guided growth and development. Descartes and other innovators charged that these active principles were obscurely understood and sought to replace them with a clear conception of living processes as material processes. Although Descartes' equation of matter with pure extension was ultimately

unsuccessful, his writings offered a coherent picture of a world of geometrically conceived matter in motion during a time in which geometry was the paradigm of intelligibility.

Descartes' mathematically oriented approach to matter was successful in a general way. As reconceived by Newton, it became standard. Mass replaced Descartes' volumetric notion of quantity of matter. Kinds of matter were sorted by specific gravity (mass per unit volume). Force became more fundamental than extension, so that Kant could claim that extension arises through a force of repulsion. In the nineteenth century, fundamental forces were investigated, and the twentieth century saw new forces and microparticles, including massless particles and cloud-like particles. Hard little particles having only size and shape seem like a quaint picture from the past.

Descartes claimed to have a direct intellectual intuition of the real characteristics of matter. Abandoning claims of *a priori* insight into the natures of things, modern science moves back and forth between theoretical conjecture and empirical evidence. The notion that the human mind has innate access to the fundamental properties of matter is refuted by the actual development of the physical sciences, in which the previously unimaginable theories of general relativity and quantum mechanics arose through theoretical and empirical give and take.

The nineteenth-century Darwinian T. H. Huxley hailed Descartes as a physiologist of the first rank for advancing the hypothesis that animal and human bodies are machines. Descartes wanted to explain biological processes using the same physical principles that apply everywhere else in nature. On this view, living things differ from nonliving things only in the organization of the matter they contain, not because of any special life force or principle of vitality.

The mechanistic approach to the body was a major conceptual contribution, but it has limits. Comparing the body to a machine invites the question of whether it has a design. If it does, then functions can be assigned to its parts based on their intended service. Descartes, in the *Treatise on Man* (11:120) and *Meditations* (7:80, 87–89, 374), wrote as if the machine of the body was designed by God. Yet the *Discourse*, *Principles*, and correspondence

offer the tantalizing hypothesis that everything on Earth, including plants and animal bodies, arose from the primeval soup through the natural processes of matter colliding with matter (6:42–44; 8A:99–100, 203; 2:525), ruling out direct design.

Subsequent to Darwin's *Origin of Species* (1859), modern science rejected the notion that organisms were directly created by intelligent design. But the need to account for our perception that the parts of organisms serve functions remains. Some philosophers find that evolution plays the role of designer, crafting organisms through natural selection; evolutionary pressures operate on variations among heritable traits to select the more successful structures. Others reject such explanations as mere metaphor. There remains an open problem, arising from the success of the mechanistic picture combined with its incompleteness.

MIND AND BODY

Descartes' most active legacy pertains to mind. His most famous position is mind–body dualism. His more general legacy concerns the description of mental phenomena and the problem of fitting the mental into the natural world. In these areas, Descartes made lasting contributions in the form of insightful descriptions and persisting problems.

Descartes' dualism is often ridiculed. The most frequent complaint is that, by making the mind a separate substance, Descartes excluded it from the domain of scientific investigations – a charge repeated by John Searle in a section on "Descartes and Other Disasters" (in his book *Mind*). Earlier, Gilbert Ryle accused Descartes of a fundamental philosophical error, called a "category mistake," which consisted of treating the mind as if it were a thing like the body, as if it underwent processes so as to yield causal outcomes. For Ryle, mindedness is a quality of behavior (its clever or humorous manner) and not the possession of processes that cause behavior. In between, Chomsky claimed that Descartes was a predecessor of his own pathbreaking theory that human language is psychologically unique, not arising through general intelligence but from an innate language faculty. All three claims about Descartes are wrong, in different ways.

REALISM ABOUT THE MENTAL

Descartes was a realist about the mental. He was the ultimate realist because he posited a distinct mental substance. But leaving his two-substance ontology aside, he was a realist about mental phenomena themselves. Even before presenting any argument about the ontology of mental phenomena (whether they are, at bottom, immaterial or material), he affirmed the existence of thoughts, including feelings, sensations, imaginings, remembrances, desires, and volitions.

His argument for mind–body dualism relied on the claim that the mental and the material form two distinct classes of phenomena. That claim does not itself entail dualism, and it remains under discussion now. In the mid-twentieth century, many philosophers and scientists came to believe that mental phenomena are difficult to integrate into the natural world (often identified as the material world). On this view, mental phenomena are not natural phenomena in their own right. To be retained in a properly naturalistic picture of the world, they must be reduced to physical or physiological processes or else (with Ryle) redescribed so as not to involve processes at all. The psychologist B. F. Skinner and the philosopher W. V. Quine believed that this aim was hopeless and recommended eliminating mental talk altogether. Many now take it as obvious that mental phenomena exist and must be included in a complete account of what there is, whether reduction proves possible or not. There are few substance dualists among philosophers today. Some endorse property dualism, acknowledging irreducibly mental properties in addition to physical properties. Others think of the mental as an aspect that some or all physical things have. They might be dual-aspect theorists (mental and physical are two aspects of one underlying reality) or panpsychists (all material things have a mental aspect).

The ontological status of mental phenomena was not settled by Descartes and has not been fully decided today. For Descartes, mental phenomena such as color sensations exist as modes of mind. The phenomenal red we experience was, accordingly, the content of an idea. Yet he did not hold that the mind literally possesses the property of being red, any more than he held that

the (non-extended) mind is literally square when we sense or imagine a square. (In that case he may have held that the pineal gland has a square pattern on it.) The problem arises of where phenomenal red can be if the mind is not literally red and red is not a real quality. His dualism did not solve this problem, for he never explained how a non-extended mind, even if interacting with the body, can have the phenomenal experience of red. He simply stated that it happens (perhaps resulting from the obscure perception of a surface texture, as interpreted herein). Similarly, materialists today argue that phenomenal red is just something that happens when certain patterns of ionic activity occur in the visual cortex. Despite knowing (up to a point) which patterns of activity cause which sensations, even now no one can explain how ionic activity can be, or can produce, the phenomenal experience of red.

Descartes' notion of psychophysiological laws remains useful in the study of mind, belying Searle's claim that he excluded mind from scientific investigation. Descartes argued that, through empirical study, many types of mental states (sensory and emotional) can be correlated with brain states. Neither a dualist nor a materialist need expect, *a priori*, that such correlations exist; prior to empirical study, any pattern of relations between brain states and mental contents might obtain. But there are correlations, which are studied under ever finer resolution. This empirical enterprise builds on Descartes' contribution in hypothesizing empirically knowable psychophysiological laws.

CONSCIOUSNESS, REPRESENTATION, AND INTENTIONALITY

In the Synopsis and Meditation 2, Descartes characterized the thinking thing as having an intellectual nature, and in Meditation 6 he argued that intellection was essential to other mental capacities, such as sense perception and imagination. In these places he did not make consciousness the essence of mind, although it figured prominently in Meditation 2 as a feature of all thought (also 7:246).

Meditation 3 contends that all thoughts involve ideas and that all ideas are "as it were of things" (7:44). All ideas (in the strict

sense) present individual objects (more widely, ideas have abstract concepts and relations as content). This suggests that representation, or what is now called "intentionality" (in a meaning derived from, but not equivalent to, that in Ch. 8), is the essential feature in Descartes' account of mind. Chapter 8 proposed that Descartes made intellection the essence of mind. All thoughts, even those involving other "forms" (7:37), such as volitions and emotions, are directed to an object. Intellection is perception, and ideas, as its modes, are essentially representational. (In this connection, as we saw in Chs. 4 and 7, thought and representation are more fundamental than language, belying Chomsky's claim that Cartesian thought is essentially linguistic.) Perception or representation may well constitute the essence of mind according to Descartes.

Because the essential feature of thought is perception, consciousness naturally occurs in thoughts. The perceptual and representational character of thought, together with the presumed simplicity of mental substance, entail that every idea must, by its nature, enter awareness. Descartes suggests this to Mersenne: "What I say later, 'nothing can be in me, that is to say, in my mind, of which I am not conscious,' is something I proved in my *Meditations*, and it follows from the fact that the soul is distinct from the body and its essence is to think" (3:273*). If the essence of thought were consciousness, then this "proof" simply reasserts that one is aware of all thoughts because the essence of the soul is to be conscious – not much of a proof. On the present view, the proof runs: In a purely mental substance, whose essence is perception, there is no place for any thought to hide. Because mind is a representing substance, all its occurrent states are represented. (Which need not mean that all thoughts are made explicit objects of reflection.)

From many present-day perspectives, consciousness and the mental are not coincident. Consider several mental functions: representing the current environment (senses), detecting the presence of food (classification), representing previous states of the environment (memory), adjusting behavior in response to its outcomes (learning), representing possible states of the environment (imagination), and acting to achieve an end (volition). Some of these functions, under the general description given, take place in

amoebas, most in flatworms, and all or most in cats and dogs. Although no one knows for certain whether amoebas and flatworms are conscious, let us suppose amoebas are not. Yet, in some sense, they detect food. A "mental" function occurs without being accessible to consciousness, even in principle. It can be debated whether food detection in amoebas counts as mental, but we can imagine that a nonconscious being, such as a robot, could perform all of the above-named functions (under a behavioral description). More generally, modern cognitive science posits various subpersonal and nonconscious but nonetheless mental acts of information processing. (This position is not restricted to those modern cognitive scientists who deny that consciousness is real.) From one present-day perspective, there is no necessary connection between mentality and consciousness.

As we saw in Chapter 9, Descartes attributed versions of the above functions to animal machines devoid of consciousness and thought. In those machines, he allows Rylean situationally appropriate behaviors without a ghost in the machine. But our overall assessment of Ryle's claims must concede that, in the human case, Descartes located a "ghost" (immaterial substance) in the machine of the human body, which we may now regard as a mistake. Ryle's deeper criticism, that Descartes ascribed processes to this substance to explain mentally characterized modes of behavior, must be assessed separately. According to Ryle's argument, and leaving dualism aside, there can be no processes in the body of any kind that "explain" ordinary successful behavior. Psychology and neuroscience can only explain mistakes. Accordingly, modern cognitive science is impossible. Here, Descartes and cognitive science fare better than Ryle.

Descartes advanced an "act" and "object" analysis of thought, according to which all thoughts have objects. All thoughts can be characterized by their content plus a further act in relation to it, whether perceiving, judging, desiring, willing, or what have you. Empiricists such as Hume took an opposing tack, attempting (successfully or unsuccessfully) to reduce thought to bare impressions and ideas (considered literally as images) and the laws of their succession. More recent philosophical analyses of "propositional attitudes" into content and attitude reflect the earlier act–object

analysis. This aspect of Descartes' thought is also taken up by the phenomenological tradition.

THE WISDOM OF THE BODY

In his metaphysical *Meditations*, Descartes focused first and foremost on the self as a thinking thing. After challenging the usefulness of the senses in Meditation 1, he ignored the body and the senses for nearly all of Meditations 2–5, reinstating them only in Meditation 6. As a result, he is sometimes described as denigrating the body, the senses, and bodily feelings and emotions.

In fact, Descartes ignored the senses and body only for the purpose of achieving metaphysical knowledge. He asks his readers to consider the uncertainty of the senses, "for I judge that this is indeed required for perceiving certainty in metaphysical matters" (7:162). Descartes did not recommend adopting the attitude of the *Meditations* in ordinary life or even in the extended pursuit of theoretical knowledge. He wrote to Elizabeth that it was his rule never to spend "more than a few hours a day in the thoughts that occupy the imagination, and a few hours a year on those that occupy the intellect alone" (3:692–93). Everyone should, "once in one's life," come to understand the principles of metaphysics (3:695; see also 10:395, 398). But "it would be very harmful to occupy one's intellect frequently in meditating on [the principles of metaphysics], because that would not allow the intellect to concern itself as fully with the functions of the imagination and the senses" (3:695).

Descartes himself used the senses and imagination in pursuing natural philosophy, including making his own observations. Early on, he determined the angles of reflection and refraction in water droplets (using water-filled glass spheres as his model) that produce the rainbow (*Meteorology*, disc. 8). His most sustained investigations concerned animal bodies. During the 1630s, he dissected animal parts he collected in the villages (1:263, 2:525). Returning to his physiological studies in the 1640s, he left incomplete the *Description of the Human Body* but finished the *Passions*, each presenting aspects of human physiology.

We have just been reminded that Descartes attributed significant "wisdom" to mindless animal bodies and to the human body acting without mental direction, including the psychological functions just listed: sense, classification, memory, learning, imagination, and action. (On mindless imagination, see the *Treatise* [11:177–85].) Although the body alone has no genuinely *mental* wisdom, it does respond appropriately to environmental circumstances, naturally pursuing benefits and avoiding harms. Moreover, Descartes ascribed to the body a significant role in the creation of visual experience (Ch. 9). Visual perception of direction and distance can arise through bodily mechanisms that directly cause those experiences in the mind, without requiring any mental calculation or other judgmental process (belying Crary's claim that Descartes overrationalized the visual sense).

Descartes held that the human mind is naturally adjusted to the wisdom of the body. Mind–body union is constituted by God or nature so that the mind is led to want the things that the body has already undertaken for the sake of preservation (Ch. 9). The function of passions (body-based emotions) is to "dispose the soul to want the things that nature deems useful for us and to persist in this volition; and the same agitation of the spirits that normally causes the passions also disposes the body to make movements that help us to attain these things" (11:372). The mind is yoked to the wisdom of the body. The animal spirits set the body in motion, to approach what is good and flee what is bad, and the same spirits cause the mind to want the good thing and to avoid the bad.

On Descartes' theory, we are naturally in touch with our bodies. Through rational reflection we have some control over bodily inclinations, but this requires effort and often is not accomplished by a simple act of will (11:359–70).

Descartes' theory of hugging exemplifies the intimate connection between bodily response and conscious feeling. Hugging is elicited through physiological changes that occur when an object of love is near: "one feels some kind of heat around the heart, and a great abundance of blood in the lungs, that makes one open the arms as if to embrace something." The arms are thus far governed by purely mechanical causes. The state of the body also affects the

mind, making it "inclined to join to itself willingly the object presented to it" (4:603). Consequently, the mind causes the body to embrace the beloved.

The love one feels on such occasions is, in Descartes' view, a confused and confusing sensation. He explained this by observing that our adult emotions are conditioned by early bodily experiences, including those in the womb. He theorized that we experience only four emotions in the womb – joy upon becoming united with a healthy body, love at receiving nourishment in the womb, sadness when it is lacking, and hatred if unnourishing matter comes to us (4:605).

> These four passions, I believe, were the first we had, and the only ones we had before our birth. And I also believe that they were then only sensations or very confused thoughts, because the soul was so attached to matter that it could not yet do anything else except receive various impressions from it. And although some years later it began to have other joys and other loves besides those that depend only on the body's being in a good condition and suitably nourished, nevertheless, the intellectual element in its joys or loves has always been accompanied by the first sensations that it had of these four, and even by the motions or natural functions that then occurred in the body.
>
> (4:605)

Whether Descartes' description of the complex psychology of love drew mainly on his experiences with the cross-eyed girl of his youth (5:57), the woman for whose honor he dueled in his late twenties, the housekeeper with whom he fathered a daughter in his late thirties, or feelings for Princess Elisabeth around the time he was fifty, we do not know. In 1647, when he wrote the just-quoted letter to Chanut, the French ambassador to Sweden, he apparently was experiencing love (suggesting it was Elisabeth), for he wrote that "to treat of everything that pertains to this passion would require writing a large volume, and although its nature is to make one communicate as much as one can, so that it incites me to try to tell you more than I know, I still want to restrain myself for fear that this letter may become tediously

long" (4:606–7). Presumably, it is not thinking about the theory of love that makes one communicative, but the feeling itself, meaning that Descartes was experiencing it at the time.

Descartes' contribution was to recognize that mind and body are yoked in complex ways, conditioned by early childhood experiences starting in the womb. This contribution, though often neglected in twentieth-century caricatures of the philosopher, is becoming better known as attention turns to his descriptions of mind–body union and interaction.

DESCARTES NOW

Descartes is with us in our methods, theories, problems, and questions. His achievements in mathematics and science were incorporated into ongoing thought and have sometimes been surpassed. His contributions to philosophy appear in different lights from different perspectives. His image is used for many philosophical and rhetorical purposes. These can't be summed up in a single slogan; nor should they be, for Descartes' legacy and contribution are ongoing.

The single most salutary example Descartes offers today is the image of the philosopher as intellectually and culturally engaged. Descartes was on to the hot topics of his day. He was in the thick of developing mathematics and the new science and revising metaphysics and its epistemology. Few think that philosophy should hope to achieve his grand ambitions today. And in fact it cannot. Once we've accepted that the fundamental theory of the universe cannot be perceived through *a priori* insights of pure intellect, we lack a method by which philosophy might in one step move to the frontier of all human knowledge. Nonetheless, philosophers can continue to work at the frontiers of knowledge, as participants in conversations that elucidate, criticize, and revise core concepts of the arts, sciences, and humanities, and critically reflect on human institutions and practices. Because philosophers can't claim special non-empirical access to those core concepts and practices, we must engage the world of experience – not merely reflecting on our own experience, but also keeping up with knowledge and practice in other areas that bear on the objects of philosophizing.

Descartes firmly believed that you can't do philosophy without knowing anything – and that philosophy could by itself come to know the basis for everything. Today, we are finding again that you can't do philosophy without knowing anything. But we also know that the basis for everything can only be found in everything. We can no longer look inward to find it; philosophy must look outward. That, too, is part of Descartes' heritage, the combined legacy of a broadly aimed philosophy deprived of its rationalist methodology. To pursue Descartes' broad philosophical ambition we must replace the method of pure intuition with an engagement with the achievements, uncertainties, and ongoing projects of our time. No one who understands the goals and failures of Descartes can still believe, as did he, that philosophy by itself could change the intellectual world overnight. We can no longer hope to start over from scratch and reconstruct all knowledge on a single plan. We must begin in the middle, even as the framework provided by current knowledge is moving on.

One way to start in the middle is by immersion in current knowledge in all relevant fields. Another is study of the history of philosophy, the sciences, the arts and humanities, and human institutions and practices. We no longer can hope, as did Descartes, to gain intellectual distance by turning away (even if only momentarily, as he sought to) from the senses and the past. Study of the history of problems, solutions, theories, methods, and concepts is a way to look afresh at things today. Study of the history of thinking is a tool for seeing how to continue now. Study of Descartes, who wanted to make history irrelevant to philosophy, and of his *Meditations*, which was designed to tap into ahistorical intellectual perceptions, is one way into philosophy now. With no Archimedean point available, history can serve as both ballast and tool in relation to the present. But, with apologies to Descartes, for us there is no one true method toward knowledge or one true theory of what knowledge is – which leaves lots of philosophy to be done.

REFERENCES AND FURTHER READING

Michael Moriarty, *Early Modern French Thought: The Age of Suspicion* (Oxford: Oxford University Press, 2003), 53, asks whether readers

today, who have studied (postmodern) theorists such as Lacan and Foucault, have gotten their Descartes from those authors (who at least did read Descartes) rather than from Descartes' own works.

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The sense-data interpretation of Descartes is widespread, often aligned with incorrigibility and transparency; two examples are Richard Rorty, *Philosophy and the Mirror of Nature* (Princeton, N.J.: Princeton University Press, 1979), and M. Williams, "Descartes and Doubt," in A. Rorty, 117–39. In response, see Hatfield, "Epistemology and Science in the Image of Modern Philosophy: Rorty on Descartes and Locke," in Juliet Floyd and Sanford Shieh (eds.), *Future Pasts: Reflections on the History and Nature of Analytic Philosophy* (New York: Oxford University Press, 2001), 393–413; challenging transparency, Rozemond, "The Nature of Mind," in Gaukroger, *Descartes' Meditations*, 48–66, and Hatfield, "Transparency of Mind: The Contributions of Descartes, Leibniz, and Berkeley to the Genesis of the Modern Subject," in Hubertus Busche (ed.) *Departure for Modern Europe: A Handbook of Early Modern Philosophy (1400–1700)* (Hamburg: Meiner, 2011), 361–75. Thomas Reid, *An Inquiry into the Human Mind, On the Principles of Common Sense*, 4th ed. (London: Cadell, 1785), ch. 1, sec. 7, diagnoses external world skepticism as the ill-effect of the Cartesian theory of ideas. On the history of the problem of the external world, see Hatfield, "Psychology, Epistemology, and the Problem of the External World: Russell and Before," in Erich Reck (ed.), *Historical Turn in Analytic Philosophy* (London: Macmillan, 2013), 171–200.

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On the role of rational arguments concerning the existence and properties of God in subsequent intellectual history, see Alan Charles Kors, *Atheism in France, 1650–1729: Volume I: The Orthodox Sources of Disbelief* (Princeton: Princeton University Press, 1990). See also Moriarty, *Early Modern French Thought*.

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Noam Chomsky, *Cartesian Linguistics: A Chapter in the History of Rationalist Thought* (New York: Harper & Row, 1966), 4–5, makes language basic to thought in Descartes; for criticism, see

W. Keith Percival, "On the Non-existence of Cartesian Linguistics," in R. J. Butler (ed.), *Cartesian Studies* (Oxford: Blackwell, 1972), 137–45. Gilbert Ryle, *The Concept of Mind* (London: Hutchinson, 1949), portrays the Cartesian myth of the mental; Chomsky, 12, replies to the allegation that a psychology of normal behavior is impossible, as does Jerry A. Fodor, *Psychological Explanation: An Introduction to the Philosophy of Psychology* (New York: Random House, 1968), ch. 1. David and Alan Hausman, *Descartes's Legacy* (Toronto: University of Toronto Press, 1997), praise Descartes' innovative theory of intentional ideas.

Jonathan Crary, *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century* (Cambridge: MIT Press, 1990), argues that Descartes treated the *camera obscura* as a model for vision, when clearly he treated it as a model of the eye, not vision. Although using geometry in his visual theory, Descartes did not base visual experience fundamentally on geometrical calculation, as we saw in Chapter 9.

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APPENDIX

ARGUMENTS, DEMONSTRATIONS, AND LOGICAL FORM

Arguments are a means of generating philosophical conviction. In philosophical texts, arguments are typically presented in a series of sentences leading to a *conclusion*. Sentences that support the conclusion are called *premises*. In a *formally valid* logical argument, the premises *entail* the conclusion, which means that if the premises are true, then, in virtue of their logical form, the conclusion must be true. The logical form is the argument's abstract structure and, as in the example below, is independent of the truth, and even the content, of the premises.

In its bare-bones structure, an argument can be set out in labeled steps. Here is an example of a logically valid argument:

(A) All dogs have fleas.
(B) Fido is a dog.
(C) Therefore, Fido has fleas.

This argument, with a universal *major premise* (A) and a *minor premise* about a particular (B), entailing a *conclusion* (C), follows a logical form in syllogistic logic as set down by Aristotle.

The fact that an argument is logically valid does not mean that its premises or conclusion are true. That is a separate question. The above argument is valid; the conclusion "logically follows" from the premises. This would be so even if the premises, (A) and (B), were false. If an argument is both logically valid and has true premises, it is *sound*. This means that the conclusion is established as being true by the argument, in virtue of true premises and correct logical form. (Descartes did not use the terms "valid" and "sound" in this way, that technical usage is more recent; but he understood the distinction [7:115–16*].)

What happens if the premises or conclusion are false or the argument invalid? If the conclusion is false (Fido doesn't have fleas), then, if the argument is valid, one or more of the premises must be false. In the example, it is false that all dogs have fleas. But even if that premise were true, it might be that Fido is a cat or a stuffed animal. If either (A) or (B) is false, then the argument does not establish the truth of (C). Nonetheless, the conclusion can still be true; Fido might have fleas, even if other dogs do not. In general, if an argument is valid but the premises are false, or if the premises are true but the argument is invalid, then the truth of the conclusion is not settled.

As discussed in Chapter 1, Descartes was not fond of syllogistic logic and preferred mathematics as his model of reasoning. This meant that he wanted to reduce his reasoning to simple steps, each of which was evident on the face of it, without being put in the artificial mold of the syllogism (10:405–6, 9A:205–6). The arguments he presents in sentences may therefore follow other forms than the standard syllogisms.

There are other formal structures, now considered to be more basic than standard syllogisms. (These were added to logic by Aristotle's followers, but are not standard syllogisms.) Mathematicians had regularly used these forms without naming them, as did Descartes. They include the simple reasoning called *modus ponens*, which runs as follows:

If P then Q.
P.
———
Q.

"*P*" and "*Q*" stand for sentences. The ruled line indicates that *Q* logically follows from the premises above the line. In this book, other devices have been used to mark the conclusion, such as the connective "therefore" (as in the example below).

An argument concerning Fido and fleas can be rendered in *modus ponens* as follows:

(1) If something is a dog, it has fleas.
(2) Fido is a dog.
(3) Therefore, Fido has fleas.

The logical form of this argument is different from that of our syllogism. In the syllogism, it is a condition on the truth of (A), "All dogs have fleas," that there exists at least one dog. Premise (1), "If something is a dog, it has fleas," has no such requirement. It can be true even if there are no dogs. Modern logic distinguishes claims about universal connections between predicates from claims about the existence of individuals having those predicates. Standard syllogistic logic did not make that distinction.

In ordinary human reasoning, *modus ponens* appears often. It is used whether one is explicitly aware of its logical form or not, just as the syllogistic forms might also be used. The fact that Descartes spoke out against the syllogism does not mean that he did not argue in a logical manner (7:455). Rather, he did not consider explicit use of formal syllogistic structure to be central to good argumentation or to finding the truth. He accepted transitions between steps in arguments without needing to formulate the argument in an explicit logical schema. Thus, from (A), "this thing is a dog," he might think we immediately see that (B), "this thing is an animal." One might require that a universal premise (U), "whatever is a dog is an animal," be stated. However, Descartes held that we can trust our intuitive sense that (B) follows from (A) without needing to make (U) explicit. He explained this attitude in his dialogue, *The Search for Truth*. Reflecting on arguments similar to the *cogito* reasoning of Meditation 2, his mouthpiece, Eudoxus, says:

> I cannot but stop you here, not to lead you off the road but to encourage you and make you consider what good sense can achieve if given proper direction. For is there anything in what you have said that is not exact, that is not legitimately concluded, that is not correctly deduced from what has gone before? All these points have been stated and worked out not by means of logic, or a rule or pattern of argument, but simply by the light of reason and good sense. When this light operates on its own, it is less liable to go wrong than when it anxiously strives to follow the numerous different rules, the inventions of human ingenuity and idleness, that serve more to corrupt it than render it more perfect.
>
> (10:521)

In speaking of "deduction," Descartes does not have in mind formal deduction according to rules of logic but rather the procedure, described in the *Rules* (10:369–79), of arriving at a conclusion by following steps of reasoning evident to "good sense" or the "light of reason." (Some of Descartes' contemporaries distinguished reason, as the faculty of transitions between steps in an argument, from the intellect, as the perceiver of individual propositions; Descartes did not adhere to such a distinction.)

Descartes' model of good argumentation was mathematics. Virtually all Descartes' readers would have known Euclid's *Elements* (at first hand or through a textbook). It was structured with definitions, postulates, and axioms (or "common notions"). Some of the axioms have the form of premise (1) above; for example, "If equals be added to equals, the wholes are equal." Descartes accepted such axioms as self-evident (9A:206). In Euclid's *Elements*, the definitions, postulates, and axioms were used to demonstrate theorems. However, Euclid did not rely exclusively on logical transitions between sentences in his demonstrations. In many cases, spatial relations exhibited in diagrams played an ineliminable role. Diagrams constructible with compass and straightedge were essential for some of his geometrical proofs. For example, when it was said to place a point on a line segment between its two ends, the resulting construction relied on the assumed spatial structure of the line segment. That is, it was taken as given that all points of the segment lie between the two

end points. This meant that a point located anywhere on the segment was already known to be between the end points.

Euclid's use of diagrams and spatial structure were criticized during the mathematical revolution of the nineteenth century. Appeal to drawn or imagined spatial structures in a proof was now considered "inexact," and Euclid's demonstrations were seen as incomplete or defective. The perspective underlying such criticism was foreign to Euclid: it made arithmetic and algebra more fundamental than geometry, translating geometrical relations into algebraic operations. In effect, the nineteenth-century revolution altered the subject matter of mathematics so as to make numerical structure (or, on some views, set-theoretic structure) primary. Euclid's methods were not suited to the new algebraic conception of geometry. In the case of betweenness and the line segment, the segment would now be treated as part of the real number line, its points as numerical values, and betweenness would be determined through the relations of "more than" or "less than." (This was not Euclid's procedure, or even Descartes'.)

The nineteenth-century revolution was in part made possible by an area of mathematics that Descartes helped to create: analytic or algebraic geometry. But Descartes himself did not advocate a fully algebraic geometry, and he retained the spatially understood notion of "extension" as his primary mathematical notion. He considered spatial structures to be a particularly clear means for representing the differences and relations between things of any type (as in the diagrams in Rules 12 and 14 [10:413, 450]). He admitted into his geometrical constructions (*Geometry*, 6:389) various curves generated by the point of intersection between certain moving lines (motion requires space). He held that the various arithmetic operations (addition, subtraction, multiplication, and division) can be clearly and evidently represented through operations on line segments (10:464–68). When he stated a preference for self-evident reasoning over logical syllogisms, he partly had in mind geometrical reasoning from diagrams in a manner that was not rendered logically explicit (and, we might note, could not have been with the syllogistic resources of the time), but which nonetheless had the force of proof.

After the time of the *Rules*, Descartes came to hold that the structure of extension can be grasped by the pure intellect independently of images and imagination. However, this does not mean that he diminished the value of the spatial structure of extension in geometrical reasoning; he now claimed that such structure can be grasped by pure intellect (7:72–73). The primacy of spatial structure can be seen by asking what Descartes could have meant in describing extension as "continuous quantity" (7:63); there was no numerical understanding of continuity at this time – continuous magnitude was represented by the geometrical line. In this later period, Descartes still held that mathematical reasoning typically draws upon the imagination (3:692), that geometrical figures can be represented in imagination (7:72), and that extension can be distinctly imagined (8A:323). Further, Descartes' stated preference (Ch. 2) for the "analytic" method of exposition in metaphysics over the synthetic method of Euclid's *Elements* is no challenge to this interpretation, because "analytic" there has a different meaning from "analytic" or algebraic geometry.

Descartes considered mathematical reasoning, proceeding by small, evident steps, to be more indicative of true understanding than arguments that seek to convince simply by dint of formal structure. He did not limit self-evidence to mathematics. He found it in other ideas or notions that were not geometrical, did not include spatial extension in their content, and therefore could not be imagined (represented in an image). Such are the idea of God as an immaterial being and the notion of God as cause. He claimed to find connections among ideas that were self-evident, not because they satisfied a logical form but because the content of the idea or notion revealed an evident connection upon "mental inspection." Another example is his axiom that "Concerning every existing thing it is possible to ask what is the cause of its existence" (7:164). By his lights, this is self-evident simply from considering the primitive notions of thing, existence, and cause.

Descartes relied on the intuitive certainty of self-evidently true steps of reasoning, rather than on explicit appeal to abstract logical form. His success must be determined by evaluating his individual arguments – not only those few presented in explicit logical form but especially those that appeal to self-evident

implications from primitive ideas or notions, such as thing, existence, cause, or thought. In analyzing his arguments for ourselves, we may seek to clarify their implicit structure by stating them as explicit, logically valid arguments. In so doing, we should aim to draw out the implicit structure that Descartes relied on in following "good sense" or "the light of reason."

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On Descartes' nonformal notion of "deduction," see Desmond M. Clarke, *Descartes' Philosophy of Science* (University Park: Pennsylvania State University Press, 1982), appendix 1. On his achievements in analytic geometry, see Henk J. M. Bos, "On the Representation of Curves in Descartes' *Géométrie*," *Archive for History of the Exact Sciences* 24 (1981), 295–338, and *Lectures in the History of Mathematics* (Providence, R.I.: American Mathematical Society, 1991), chs. 2–3. On the nineteenth-century revolution in mathematics, see Bos, *Lectures*, ch. 9. Original sources in nineteenth-century mathematics, including Felix Klein's discussion and criticism of arithmetization, are in vol. 2 of William Ewald (ed.), *From Kant to Hilbert: A Source Book in the Foundations of Mathematics*, 2 vols. (Oxford: Clarendon Press, 1996). The nineteenth-century criticisms of Euclid's proofs as "incomplete" are elaborated in Moritz Pasch, *Vorlesungen über neuere Geometrie* (Leipzig: Teubner, 1882), and surveyed in H. Eves, *Survey of Geometry*, 2 vols. (Boston: Allyn & Bacon, 1963–65), sec. 8.1. On the mathematically sound use of spatiality and diagrams in Euclid's proofs, see Lisa Shabel, *Mathematics in Kant's Critical Philosophy: Reflections on Mathematical Practice* (London: Routledge, 2002).

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