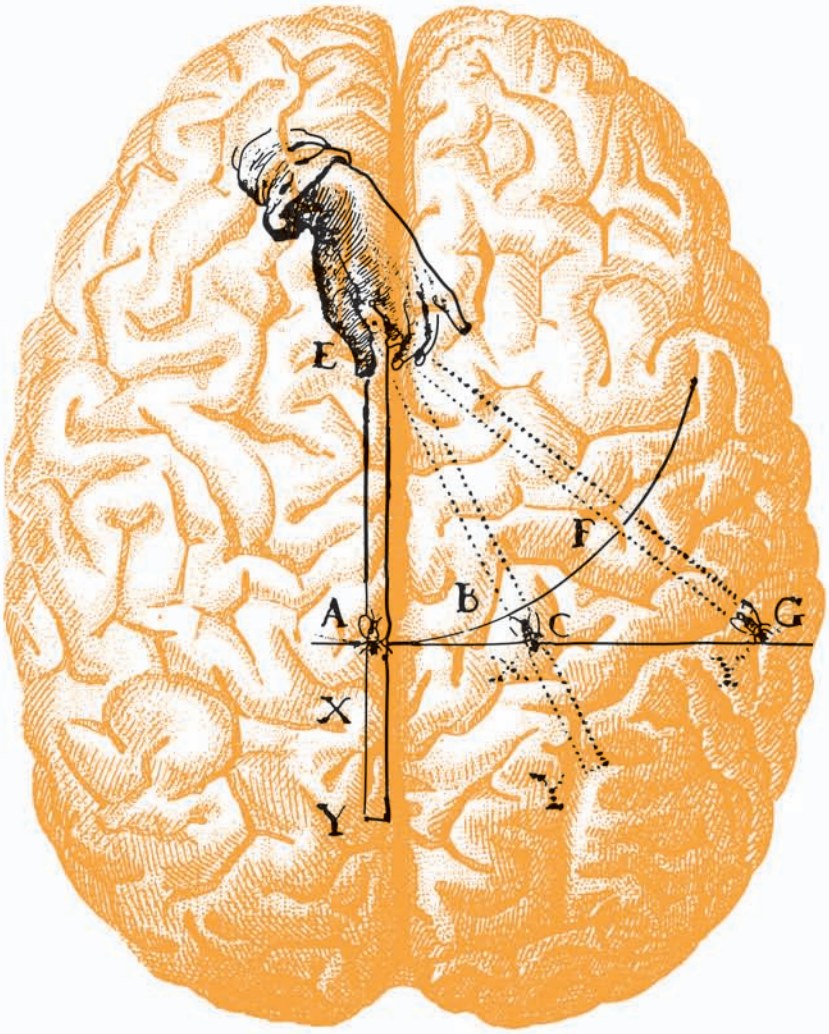

Descartes's Changing Mind

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Peter Machamer & J. E. McGuire

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For our two Barbaras

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PREFACE

This book has been a long time in gestation. We began talking to each other about these topics around 1970 or so. We have taught, conjointly and individually, many seminars on Descartes and related topics for more than thirty-five years. Most memorable is the one that occurred in 1979 when we joined with Wilfrid Sellars, and we taught as a triumvirate (father, son, and holy ghost). That seminar was particularly well attended. To Wilfrid we owe a great debt, for he was inspirational in teaching us to think philosophically.

We want to say a word about the genre of our work. It is neither intellectual biography nor contextualized history. Rather, it is a chronological narrative that is organized around our philosophical analyses of the Cartesian corpus. The basic point is that Descartes, like most thinkers, grew, developed, and changed his mind as he worked throughout his life. There have been many studies, at least in part, devoted to the internal development of Descartes's thought. The early work of Gilson (1951), Kemp-Smith (1952), and Alquié (1950) stands out in this regard, as do more recent studies by Hatfield (2003), Garber (1992), Beyssade (1994), Ariew and Cress (2006), Hattab (1998), Guéroult (1968), Gaukroger (1995), Rodis-Lewis (1992), Mehl (2001), Clarke (2003), and Schmaltz (1997, 2008). However, none concentrates on the differences between *The World* (c. 1633) and the *Principles of Philosophy* (1644) in a way that exhibits sufficiently the contribution the *Meditations* (1641) makes toward the philosophical orientation of the latter work. Without doubt Descartes views the natural philosophy of the *Principles* as deeply enmeshed in the doctrines of the *Meditations*. To be precise, he conceives the doctrine of re-creationism, which emerges in *Meditation* III, and the view that physical things are simply geometry made real, as two sides of the same metaphysical coin. Any interpretation of Descartes's natural philosophy must reflect this basic commitment in order to make explicit the relationship between the metaphysics of temporal re-creationism and the sparse ontology of extended things. This shift profoundly changes the way in which Descartes conceives the operation of causality in the world and the causal axioms that direct his thought. It is a central of aim our study to make clear the significant implications that these involve. Despite the fact that many commentators have noted changes, Descartes has suffered disastrously from being overontologized.

But also evident in Descartes's late thought are teleological and perspectivalist commitments that constitute what we call his epistemic stance. This involves the claim that our knowledge is relative to what is required for our survival and sufficient to enable us to grasp cognitively what we need in order to do science. This stance follows from Descartes's rejection of the method of abstraction, and his growing insistence on the infinity of God and his power, both of which occur during the *Meditations* period. Working out these implications, and those set by the *Replies*, provides the framework for his late treatment of innate ideas, sensation, and perception. The features of the epistemic stance are evident in the *Principles* and make that mature work different from any of Descartes's pre-*Meditations* writings.

Originally we intended this book to end with a chapter on Descartes's successors, and examine some of the ways in which they noticed and picked up on these changes in Descartes's thinking. However, the book grew too long, and this part of the project was scrapped. However, given what we say at the end of our study about Descartes's later views on the limitations of human knowledge, it may be useful to look at just one passage in John Locke, where he seems to express Descartes's late teleological viewpoint:

> The infinite wise Contriver of us, and all things about us, hath fitted our senses, faculties, and organs, to the conveniences of life, and the business we have to do here. We are able, by our senses, to know and distinguish things: and to accommodate the exigencies of this life. We have insight enough into their admirable contrivances and wonderful effects to admire and magnify the wisdom, power and goodness of their Author. Such a knowledge as this, which is suited to our present condition, we want not the faculties to attain. But it appears not that God intended we should have perfect, clear, and adequate knowledge of them; that perhaps is not in the comprehension of any finite being.
>
> (1690, book 2, chap. 23, sec. 12)

This is an example of what we call epistemic teleology, and it nicely characterizes Descartes's mature view of the scope and limits of human knowledge

We have benefited from feedback and discussions occurring over the many years we have presented variants on these themes in lectures and conferences. It is impossible to list all the people to whom we are indebted and the many ways in which we have become so. Our memories are not what they once were. But among our notable interlocutors, some of whom were once our students, are Dan Garber, with whom we have been arguing for years and with whom we inaugurated the Descartes Days, and who once introduced us as the Laurel and Hardy of the Descartes world,

Pedro Amaral, Roger Ariew, Aristides Baltas, Zvi Biener, Jim Bogen, Martha Bolton, Gerd Buchdahl, Chris Burch, Dennis Des Chene, Francesca DiPoppa, John Doyle, Abel Franco, A. J. Freddoso, George Gale, Marjorie Grene, Gary Hatfield, Helen Hattab, Brian Hepburn, Peter King, Philip Kitcher, Christopher Kurfuss, Ron Laymon, Tom Lennon, David Lindberg, Michael Mahoney, Gideon Manning, John McEvoy, Peter McLaughlin, Ernan McMullin, David Miller, John Nicolas, Paul Olscamp, Spyros Sakellariadis, Tad Schmaltz, Alison Simmons, Ed Slowik, Mark Smith, Justin Sytsma, Barbara Tuchanska, Theo Verbeek, Stephen Voss, and William Wallace. And we must not forget those who are now no longer with us: Wallace Anderson, Bob Butts, R. J. Hirst, Maurizio Mamiani, Charlie Schmitt, Dick Popkin, Robert Turnbull, and Margaret Wilson. We also wish to thank two very helpful, anonymous referees chosen by Princeton University Press.

We have often chosen to follow the accepted "standard" translations, and these are listed in our references as well as cited in the text. However, on many occasions we have translated the texts in ways we hope are clearer. Commonly, when new translations are given we include the relevant French or Latin in parentheses.

An early, very different, version of chapter 1 appeared in *Studies in History and Philosophy of Science* 37 (2006): 398–419. A radically different version of chapter 3 appeared in *Philosophica* 76 (2005): 11–44, and was coauthored with Justin Sytsma.

We wish to thank Barbara Diven Machamer for her salutary corrections and suggestions on several drafts of this manuscript. Thanks also to Tania Boster, who read proof for us, and to Benny Goldberg who not only corrected proof, but also compiled the index.

Decartes's Changing Mind

Chapter One

FROM METHOD TO EPISTEMOLOGY AND FROM METAPHYSICS TO THE EPISTEMIC STANCE

Descartes is always and ever concerned with knowledge. Around 1619 he begins his systematic philosophical work by starting to write, though never publishing, the *Rules for the Direction of the Mind* (*Regulae ad Directionem Ingenii*). In this work he lays out rules for directing the mind in its quest for knowledge. In 1649, toward the end of his life, he publishes the *Passions of the Soul* (*Les Passions de L'âme*) in which he worries about the ways in which the passions affect our knowledge and how to control them. However, the Galileo affair in 1633 provoked a crisis in Descartes's intellectual development, the import of which has not been sufficiently recognized.[1] Moreover, in replying to objections in 1640–41 to his *Meditations on First Philosophy* (*Meditationes de prima philosophiae*) he saw implications in his metaphysical position, the substance of which appears in the *Principles of Philosophy* (*Principia philosophiae*) of 1644. These events constitute significant reasons why Descartes's philosophical position concerning how we know and what we may know is different at the end of his life from what it was when he began. Descartes's epistemic views cannot be separated from other aspects of his work. Indeed, his changing position on the what, how, and why of knowledge has major implications for, and is often suggested by, his views concerning God, causality, metaphysics, and the nature of humans. A further metaimplication of the claim we are making is that any scholar who cites early Cartesian texts in support of late Cartesian positions, or uses later texts in conjunction with early ones to support a reading of Descartes's philosophy, will inevitably fall into interpretative errors.

We begin with a general outline of what we seek to establish. In the *Rules*, and in his ever forthcoming *The World* (*Le Monde ou traité de la lumière*), Descartes's aim is to develop a method for revealing how things really are. After 1633, at the time *The World* is suppressed (to Mersenne, end of November 1633; AT 1:270–71; CSMK 40–41), he begins to change his epistemic method and strategy with the result that some metaphysical shifts are evident in his later thinking. The *Discourse on Method* (*Dis-*

[1] Garber has recognized a number of these changes.

cours de la Méthode) of 1637, his first published philosophical work, is transitional in that it still maintains many of his previous ideas concerning methods and procedures for establishing the natures of things. He has, however, already made the first move toward his epistemic stance, indicated by his inclusion of the foundational cogito argument (*je pense donc je suis*) in Part IV of the *Discourse* (AT 6:32; CSM 1:127). But he still seeks truth on the basis of intuiting, through abstraction from sensory experience, the true natures of things. By 1641, in his *Meditations on First Philosophy*, Descartes begins a subtle shift toward acknowledging the epistemic foundations of what we are able to know, and now places more stress on ascertaining the limits of human knowledge. Human knowledge, for Descartes, is finite in comparison to God's knowledge, a doctrine that he held, in one form or other, at least since 1630 (to Mersenne, April 15, 1630; AT 1:146; CSMK 23). But in Descartes's post-*Meditations* period, human knowledge becomes increasingly more circumscribed in its finitude, and is tied to a teleological understanding of the role of sensations in preserving the mind-body union, and also to the ways in which we establish scientific understanding of the workings of the world. This is Descartes's shift from his earlier methodological, sensory-based orientation to an epistemological perspective specifically integrated into his metaphysical views. It is the introduction of Descartes's epistemic stance. In respect to this shift, the *Meditations* is transitional. In that work, Descartes believes himself to be in the business of apprehending simple essences or natures. For example, he conceives bodies as endowed with active powers to affect the mind (*Meditation* VI; AT 7:79; CSM 2:55; see also the letter to Regius, January, 1642; AT 3:504; CSMK 208). In *Meditation* II he argues that the essence of a piece of wax is perceived by the intellect alone, and in *Meditation* V he lays out an ontology of true and immutable natures directly apprehended by the mind alone (AT 7:65; CSM 2:77).

Sometime between 1641, the date of the *Meditations*, and 1644, when he publishes the *Principles of Philosophy*, Descartes completes his epistemic turn. Pushed by his critics' objections to the *Meditations*, in the course of making his *Replies* he begins to articulate in detail the final form of his epistemic stance. He no longer holds that humans can know with certainty all the simple natures that are present in the world. What there is instead, which we find especially in *Principles* Part II is a form of epistemic perspectivalism concerning the limited character of human knowledge. This completes the shift that begins with what we call the epistemic teleology arguments of *Meditation* VI; namely, that what we may know, and the form in which it is known, constitutes what is necessary for our mind-body preservation. The epistemic consequence of this, as we hope to show, is that the world may contain many things that we neither know

nor have the possibility of knowing. More specifically it means, for example, that we cannot know, or minimally we cannot know that we know, the real nature of substances, but only some of their useful attributes or particular modes that, yet, are still mind-independent. Concomitantly, the shift away from intuitions of simple natures is accompanied by a shift away from abstraction, as the epistemic model for gaining knowledge, to a model that requires many of our core ideas to be innate in the mind. Thus, in place of the earlier methods of abstracting by direct intuition and compounding from sensuous and nonsensuous experience, increasingly Descartes brings to the fore the view that knowledge always involves innate ideas. So at the end of his life, the conceptualization that he attributed previously to intuitions of simple natures is now largely accomplished by innate ideas, and a corresponding new doctrine concerning the establishment of complete, but not adequate, ideas. This is not to say that Descartes abandons the aim of intuitive knowledge across the board. On the contrary: as we will see in chapter 2, the cogito of *Meditation* II and the argument for God's existence in *Meditation* III rest on the belief that we possess basic and nonsensuous intuitions that are noninferential and nonpropositional. Nor does he abandon abstract ideas. In the *Principles* they play a role in his account of universals that arise "from the fact that we make use of one and the same idea for thinking of all individual items that resemble each other" (AT 2:28; CSM 2:212).

Another important development needs to be noted. This is a shift from an early concept of idea that relates to corporeal bodies, to a later completely mental conception that begins to emerge around the time of the *Meditations*. In the *Rules*, *The World*, and the *Treatise on Man*, the latter based on extensive physiological investigations, Descartes's basic use of the term "idea" focuses on the movements of animal spirits in the brain and on what occurs in imagination. For example, in *The World*, we are told that "only those [impressions or patterns] which trace themselves on the [animal] spirits (*esprits*) at the surface of the [pineal] gland . . . should be taken for ideas, that is to say, as the forms or images (*les formes ou images*) that the rational soul immediately considers" (AT 11:176–77). This "empiricist" orientation toward the nature of ideas is left behind by the time of the *Meditations*, though earlier in *The World* and the *Discourse* (AT 6:35; CSM 1:128) he also holds that ideas in some sense only occur in the mind (AT 11:3; CSM 1:81). In his mature thought, he takes *idea* "to refer to whatever is immediately perceived by the mind" (*Third Reply* to Hobbes, AT 7:180; CSM 2:127; and Schmaltz 1997, 37). Thus, ideas, understood in this general sense, are placed squarely within the disembodied mind, and the term is often used by Descartes interchangeably with the terms "thought" and "concept". As we hope to show in chapter 5, this development has significant implications for the growing

importance of innate ideas in his late thinking. This in turn contributes to his mature account of perception and to the problem of the sorts of causal *relata* that obtain between mind and body, the topic of chapter 6. As we'll see, Descartes's handling of innate ideas is contextually nuanced and demands careful exposition. Moreover, we cannot assume that Descartes is forced to privilege innate ideas because he comes to see that his optical and physiological account of perception is inadequate. A cursory comparison with Descartes's discussion of grades of sensation in the *Sixth Reply* and the *Optics* is sufficient to dismiss this view. Indeed, it's precisely because Descartes understands the need for explaining how the mind accesses sensory input that he insists more and more that sensation has an intellectual content that the senses cannot provide.

We will argue that the *Principles* represent the first complete expression of Descartes's mature philosophy and contain the fruit of the shifts we have just enumerated. Put more succinctly, the epistemic stance Descartes establishes in the *Principles* is based on four core moves: the systematic employment of his causal principles for understanding the way in which God works in the world; the augmentation of the role of innate ideas; the demotion of the senses from a privileged position in the quest for human knowledge; and a reconceptualization of the nature of matter. At this time, he also makes clear that all knowledge of the world is limited to the extent it serves the teleological goal of mind-body preservation as well as the goal of establishing systematic and useful scientific knowledge of the world. To tell this story properly, Descartes's mature work, from the *Replies* to the *Objections* to the *Meditations* onward, needs to be compared with his earlier writings. The reading we give of Descartes's philosophy emphasizes the epistemic position sketched above and also considers his related metaphysical commitments and the role they play in his thought.

Finally, Descartes's epistemic stance, with its attendant view of causality, has implications for his conception of substance, and also for the positions he develops concerning the independence of mind and body and the mind-body union. We will argue that Descartes's "dualism" has to be understood in terms of what we call his *epistemic teleology*. This means that his understanding of the mind-body distinction fits uneasily into the philosophical categories standardly imposed upon it, such as substance or attribute dualism or trialism.

One caveat needs to be introduced here. Our claim is not that Descartes critically recognized all the changes and positions we ascribe to him in exactly the way we describe them. Nevertheless, we believe that what we attribute to him are views to which he was plausibly committed. At the same time, however, we are convinced that Descartes was not always fully and self-reflectively aware of these changes, especially when changing his

mind in the face of criticism. In this respect he is like some contemporary philosophers who, having changed their mind about certain topics, insist that this is what they meant all along.

Descartes's Early Work: The *Rules*

We have claimed that Descartes's philosophy undergoes two kinds of major changes after 1633: from abstractionist methodology to epistemology and from an ontology of simple, knowable natures and common notions to the view that human knowledge of the world is limited to knowing some modes of some substances. We have also claimed that there is an additional shift leading to the ubiquity of innate ideas in his thinking, which is not to deny that earlier he considered certain ideas to be innate and to function in a more limited role. But the real shift is from ideas that represent external particulars to the view that the core of our understanding is innately constituted by ideas that are virtually nonrepresentational in their formal reality. Since this intellectual biography has implications for our reading of Descartes's philosophical views, we turn now to a chronological exposition of key aspects of his major works. We will sketch their content in order to mark clearly when the shifts take place and will weave into our narrative interpretative remarks concerning their significance.

Descartes was born in 1596. In or about the year 1619, he tells us (many years later in the *Discourse* of 1637), he began to think about philosophy and to ponder the nature of human knowledge in the sciences (*Discourse*, Part II; AT 6:12; CSM 1:16). "Science" of course, is the Latin *scientia*, and so the term covers all forms of natural knowledge: the word "philosophy" ("*philosophia*") has an equally wide-ranging use. Descartes recounts that he closeted himself (while in Germany) and began to think through the thoughts that will ultimately lead to the *Meditations* (1641). He recalls thinking about ridding himself of sensory-based opinions to which he had previously given credence, and of trying to discover new foundations for his thought. He sets himself rules to live by and then comes to the revelation that "of all those who have hitherto sought after truth in the sciences, mathematicians alone have been able to find any demonstrations" (*Discourse*, Part II; AT 6:18; CSM 1:120). So he sets about finding a "method which instructs us to follow the correct order, and to enumerate exactly all the relevant factors" (AT 6:21; CSM 2:21). He also remembers thinking that he shouldn't try to accomplish this prior to reaching an age more mature than his current twenty-three years.

When we turn to the *Rules*, it is clear that knowledge from sensory perception comes by "local motion" and "occurs in the same way in which wax takes on an impression from a seal" (Rule 12; AT 10:412; CSM 1:40). Yet "when an external sense organ is stimulated by an object, the figure which it receives is conveyed at one and the same moment to another part of the body known as the 'common' sense, without any entity passing from the one to the other (*entis reali transitu ab uno ad aliud*)" (AT 10:413–14; CSM 1:41). Still, "the power through which we know things in the strict sense is purely spiritual . . . the cognitive power is sometimes passive, sometimes active; sometimes resembling the seal, sometimes the wax . . . nothing quite like this power is found in material things. It is one and the same power, when applying itself along with the imagination to the 'common' sense, it is said to see, touch, etc. . . . when applying itself to imagination in order to form new figures it is said to imagine or conceive; and lastly when it acts on its own, it is said to understand" (AT 10:142; CSM 1:42). The goal of such examination is to distinguish carefully the "notions of simple things from those which are composed of them" (AT 10:417; CSM 1:43). Descartes goes on, "since we are concerned here with things only in so far as they are perceived by the intellect, we term 'simple' only those things which we know so clearly and distinctly that they cannot be divided by the mind into others which are more distinctly known. Shape, extension and motion, etc. are of this sort; all the rest we conceive to be composed out of these" (AT 10:418; CSM 1:44).

There are purely intellectual simple natures, material simple natures, as well as some common to both. Intellectual simple natures are such things as what knowledge consists in or the nature of the action of the will. The simple natures present in bodies are "shape, extension and motion" (AT 10:419–20; CSM 1:45), and the common notions are existence, unity, and duration as well as principles of rational inference.

The mental process that forms these clear ideas is the act of abstracting. When the mind performs an abstraction, certain features of an object are held attentively before it, while others are disregarded but not denied. Consequently, the whole is conceived imperfectly and confusedly while the mind attends clearly to one simple feature to the exclusion of others. For example, we abstract when we consider that shape is the limit of an extended thing. But, of course, the term "limit" is more general than "shape," since we can also speak of the limit of duration, and of a motion, and so forth, from which, though they are different in kind, the term "limit" has also been abstracted. Thus, central to Descartes's conception of what emerges from acts of abstracting is that "one always abstracts something more general from something less general" (AT 10:458; CSM

1:69). It is clear at this point that Descartes thinks some general (*genus*) terms arise from the process of abstraction.

In the *Rules* Descartes ties abstraction to intuition. The two main characteristics of intellectual intuition are first, the purely intellectual nature of the operation itself and, second, the absolute certainty and assurance that accompanies it. Thus, an intuition is an insight into necessary connections between two simple ideas or two elements of an idea. It is the product of attention that arises by the exclusion of irrelevant material that thereby leaves an idea's content clear and distinct. Descartes's aim here is to characterize the innate workings of the intellect to the extent that they are directed to things themselves and "in so far as they are within the reach of the intellect" (AT 10:399; CSM 1:32).

Interestingly, the examples he dwells on are the conceptions of place and motion. He jibingly argues against those who define "place" as "the surface of the surrounding body" and "motion" as the "actuality of a potential being, in so far as it is potential," two unmistakably Aristotelian doctrines. He rhetorically mocks such beliefs, asking, "Who does not know what motion is? It must be said, then, that we should never explain things of this sort by definition" (AT 10:426; CSM 1:49).

Nowhere does Descartes make his point more clearly than when he is trying to convince the reader that in dealing with bodies, we represent them best in terms of imaginable figures. He speaks in this context of the dimensions of bodies, which are modes or aspects with respect to which some subject is considered measurable. Such modes are length, breadth, depth, weight, and speed, "whether they have a real basis in the objects themselves and others are arbitrary inventions of our mind" (AT 10:448; CSM 1:63). He goes on: "The weight of a body is something real, so too is the speed of a motion, or the division of a century into years and days; but the division of the day into hours and minutes is not" (AT 10:448; CSM 1:63). Nevertheless, he says they all function similarly with respect to dimensionality and the techniques of the mathematical disciplines. It seems clear that in some cases we know what is ontically real, for example weight and speed, by means of an intuitive abstraction based on sensory perception of material objects; in other cases we know with certainty because there is a conceptual connection between the items (e.g., *cent*ury equals *100* years by definition). Yet in still other cases, there is no basis in nature or concept for the particular measure or numeration; that is, nothing in objects or thought dictates that a day must consist of so many hours and so many minutes. This division of a unit into sixty is therefore arbitrary, that is, without a basis (AT 10:438–39; CSM 1:57).

In contrast to what will emerge in his mature philosophy, Descartes here believes that human beings are capable of knowing some simple natures that are *real* parts of objects in the external world. At this time, he

believes that by the proper use of his method, we may obtain knowledge of things themselves. So the limitation on cognitive capacity we noted above is not a very stringent limit. Importantly, one of the things we know about bodies is the property of their motion. Motion is *real* for Descartes at this point in his philosophical thinking. In other words, it has, as we saw above and shall see later, the same ontic status as extension, shape, and weight. All of this will change significantly.

Yet not all things are knowable:

> if someone is blind from birth we should not expect him to have true ideas of colors just like the ones we have, derived as they are from the senses. But if someone at some time has seen the primary colors, though not the secondary or mixed colors, then by means of a deduction of sorts it is possible for him to form images even of those he has not seen, in virtue of their similarity to those he has seen. In the same way, if the magnet contains some kind of entity the like of which our intellect has never before perceived, it is pointless to hope that we shall ever get to know it simply by reasoning; in order to do that we should need to be endowed with some new sense, or with a divine mind. But if we perceive very distinctly that combination of familiar entities or natures which produces the same effects which appear in the magnet, then we shall credit ourselves with having achieved whatever it is possible for the human mind to attain in this matter. (AT 10:438–39; CSM 1:56–57)

Note that the emphasis here is solely on knowledge from sense perception or deductions from that basis as given in experience. The magnet is unknowable to the extent that it does not affect our senses. This means that the clear and distinct ideas that are useful in science have to be based on, and limited to, intuitions of sense perception, except in cases in which they are innate.

In the *Rules* Descartes does not explicitly operate with the category of innate ideas. To be sure, he stresses that certain elements in our thinking such as "I am, therefore God exists" are necessarily conjoined (AT 10:422; CSM 1:46). Although this is an instance for Descartes of nonperceptual knowledge, he does not characterize it as an innate idea. Descartes's concern is with what is necessarily conjoined in our thought, a necessity that "applies not just to things which are perceivable by the senses but to others as well" (ibid.). Thus, at this stage, the proposition "I am, therefore God exists" is an instance of necessary conjunction on all fours with the necessary conjunction of shape with extension and motion with duration (ibid.). It seems, therefore, that the notion of innateness, as used in the *Rules*, is confined largely to the working of the intellect and to a focus on what that process can produce. Thus the mind has an innate

ability to intuit simple ideas, and to assess necessary connections among them. Descartes puts his position clearly in Rule 3:

> By "intuition," I do not mean the fluctuating testimony of the senses or the deceptive judgment of imagination as it botches things together, but the conception of a clear and attentive mind, which is so easy and distinct that there can be no doubt about what we are understanding. Alternatively, and this comes to the same thing, intuition is the indubitable conception of a clear and attentive mind which proceeds solely from the light of reason. (AT 10:368; CSM 1:14)

Descartes's emphasis here is on the mind's power to discover simple natures and their connections by abstracting directly from perceptions of material objects or from thoughts that refer to such objects. The rules, if applied properly, are designed to allow human beings to obtain certain, complete, and sufficient knowledge of the simple natures of things. Certainly, Descartes sometimes uses epistemically qualifying phrases such as "those things which are said to be simple with respect to our intellect are . . ." But here he is drawing a distinction between the order of knowledge and the order of being: "Individual things ought to be viewed differently in relation to the order they have in respect to our knowledge, than if we speak of them as they really exist" (AT 10:419; CSM 1:44). This does not deny that such simple natures as, for example, shape and size, have a basis in the way things are. It simply means that these abstracted entities do not exist separately from the body that possesses them, since "the thing itself . . . is one single and simple entity" (ibid.). Thus, the main idea is that "each of us, according to the light of his own mind, must attentively intuit only those things which are distinguished from others" (AT 10:426–27; CSM 1:49). Descartes will come to regard abstraction by and from sensory intuition as vague and unhelpful as a means of establishing the positive features of our core concepts (*Second Reply*; AT 7:120; CSM 2:86).

In the *Rules* this early view takes sense perception as having a given content from which the mind abstracts in order to form representations in the imagination. These representations are spatial and their parts can be enumerated. But one can represent only what one has experienced. Descartes at this point is a good empiricist in regard to ideas that arise from sense perception. When a representation is "correct" the representation is true to the nature of the object. From this it follows that, although natures are present in the visible contents of sensation, they must be abstracted and isolated so that they may be known in a nonconfused and clear way. In the *Rules* it is well to note that Descartes conceives his method without any help from God, understood as the source and guar-

antor of truth, and without an explicit metaphysics. In fact, the terms "metaphysics" and "metaphysical" do not appear in the text, and God is mentioned only in an example used to illustrate the point that necessary propositions, when converted, are contingent (AT 10:422; CSM 2:46). This is soon to change.

Descartes has two kinds of clear ideas in the *Rules*: (1) ideas formed by innate internal apprehensions and deductions from them, and (2) representations in the imagination formed from sense experience and "quasi" deductions drawn from them. But how do the innate ideas relate to the sensory ideas? At this point Descartes lacks a theory for articulating that relation, or at the least, if he has one, he does not present it. In his later thought, the relation becomes crucial to his theory. In the *Rules* he's too much of an empiricist. It may be that in some sense he recognizes this problem, and this could well provide a reason for why he does not publish them.

By contrast, in the *Meditations* and the *Replies*, there is a clear emphasis on the role of innate ideas that are brought to bear by the mind on the particulars of experience. Yet as late as 1642, Descartes still refers to his conception of abstraction. Intellectual abstraction (*per abstractionem intellectus*), he writes, proceeds "by turning my thought away from a part of that which is comprised in the wider idea, in order to apply my thought in a better manner and to make it more attentive to the other part. This is the case when I consider a figure, without thinking of the substance or of the extension of which it is the shape" (letter to Guillaume Gibieuf, 1642; AT 3:475; CSMK 203). But by 1644, he makes clear the difference between two forms of mental apprehension: "There is a great difference between abstraction and exclusion (*entre l'abstraction & l'exclusion*). If I simply say that the idea which I have of my soul does not represent it to me as being dependent on a body and identified with it, this would merely be an abstraction, from which I could form only a negative argument, which would be unsound. But I say that this idea represents it to me as a substance which can exist even though everything belonging to body be excluded from it; from which I form a positive argument, and conclude that it can exist without the body" (letter to Mesland, May 2, 1644; AT 4:120; CSMK 236).

In 1629, Descartes arrived in Holland having, it seems, left his concern with method behind, his thoughts now turned more systematically to metaphysics. Letters to Marin Mersenne on April 15 and November 25, 1630, indicate that he has been at work on metaphysics. He tells Mersenne: "perhaps I may some day complete a little treatise of Metaphysics, which I began in Friesland, in which I set out principally to prove the existence of God and of our souls when they are separate from the body" (AT 1:82; CSMK 29). The manuscript hasn't survived, so it's impossible

to know to what extent it contained ideas that appear in Part IV of the *Discourse* and later in the *Meditations*. Descartes's reference to Friesland indicates that his metaphysical reflections began in 1628. So the years 1628–30 witness yet another significant turn in his thinking. The earlier *Rules* are methodologically and mathematically inspired, and concentrate on procedures by which truth can be elicited and known. In the correspondence with Mersenne, however, Descartes is concerned with the source of truth and with how certain truths come to be true. By the time of the *Meditations*, this perspective will have burgeoned, and Descartes will systematically portray God as both the truth producer and the truth sustainer. This decisive shift from a methodological and sensory-based foundationalism toward a metaphysics of God and truth is clear in Descartes's claim that his physical thinking would lack foundations without considering God's role in making human knowledge possible: "At least I think that I have found how to prove metaphysical truths in a manner which is more evident than the proofs of geometry" (letter to Mersenne, April 15, 1630; AT 1:135; CSMK 22). This is a claim that he will repeat frequently in the years to come.

What provoked this metaphysical turn in 1628? In our view no decisive answer is possible. Some scholars attribute the turn to Descartes's meeting in 1628 with Chandoux, and claim that it led him to an open espousal of Augustinian metaphysics (Kemp-Smith 1952, 23, 40–46; Menn 1998, 44–50, 209–20, 262–300; Menn 1997). Certainly, the theology of the French Counter-Reformation was anti-Aristotelian in spirit and based itself on the belief that Augustine's doctrines of God and the soul are the centerpiece of Catholic thinking. Moreover, in 1603 Cardinal de Bérulle established the Congregation of the Oratory. One of its central aims was to promote Augustinian theology as a tool in the advancement of Catholic causes in France. This aim chimed with a view widely held in France, that Aquinas's synthesis of Christian belief and Aristotelian philosophy had swamped the former to its detriment (Gilson 1951, 9–50; Menn 1998, 21–24).

In 1628, the papal nuncio, Guido Bagni, brought together some notables, including Descartes, Cardinal Bérulle, and Mersenne, to hear the anti-Scholastic alchemist Chandoux expound his new method of philosophizing. After Chandoux's presentation, Descartes, who appeared skeptical of Chandoux's method, was pressed to reveal his own views. Judging from Baillet's account, Descartes presented a method aimed at certainty and based on his *Rules*. Baillet also relates that later, at a private meeting with the Augustinian-inspired Bérulle, the cardinal impressed on Descartes that his duty lay in applying his talents to constructing a philosophy with theology as its focus (Baillet 1691, 1:161–63). For Stephen Menn this is a decided catalyst that helped propel Descartes to take up Augusti-

anism in pursuit of this aim, with the result that he begins to construct a physics based on non-Aristotelian metaphysical principles (1998, 44–50).

In arguing for this view, Menn appeals to the dedicatory letter of the 1641 edition of the *Meditations*. There Descartes speaks of the indispensable need to find arguments for God's existence and for the existence of the soul separate from the body in order to buttress the possibility of reliable human knowledge. He then remarks: "I was strongly pressed to undertake this task by several people who knew that I had developed a method . . . and I therefore thought it my duty to make some attempt to apply it to the matter at hand" (AT 7:3; CSM 2:4). Menn argues that Descartes's reference is to the Chandoux meeting and, in the light of Bérulle's intervention, to his renewed commitment to Augustinianism (Menn 1998, 49). This seems to be an overzealous interpretation, given that the obvious reference of Descartes to method in 1641 would be to his own *Discourse on Method* (1637). Moreover, given the complex character of the Parisian Platonic-Augustinian milieu in which Descartes moved intermittently until 1628, it is unlikely that his metaphysical turn can be pinned directly on Augustine in the way that Menn suggests. What we do know is that after the publication of his *Discourse*, Descartes was chastised for his philosophical omissions, and was besought by a number of people to develop more completely his metaphysical views concerning God, the soul, and the mind-body distinction (see below). The *Meditations* can be seen as a response to this challenge, and represents the final form of Descartes's metaphysics that contains elements of Augustinianism and Neoplatonism (Gilson 1951, 173–90; Menn 1998, 1–17). In this regard, it is well to remind ourselves that in the *Phaedo* and the *Phaedrus* Plato argues for the existence of mind or soul distinct from, and in some sense prior to, physical objects. Moreover, he conceives mind as a separate being known independently of sensory knowledge and the instrument that intuits the immaterial forms. In any event, if the Augustinian meditator seeks to achieve fuller knowledge of God in order to guide the will in acquiring virtue, Descartes's meditator is otherwise directed: he seeks divine knowledge to better know the strengths and limitations of his cognitive powers so as to curb the error-prone weaknesses of the will. Certainly both thinkers held that the self submerges itself into the infinity of God. But the difference in meditative aim between himself and Augustine was well recognized by Descartes. (See the letter to Colvius of November 14, 1640; AT 3:247; CSMK 159.) Augustine's was spiritual; Descartes's is cognitive.

However, given Baillet's penchant for hyperbole, we can be reasonably skeptical of his account of Descartes's encounter with Bérulle (Watson 2003, 142–45; Grayling 2005, 132–37). It is more likely that the meeting (if indeed it took place), far from affirming Descartes's commitment to

Augustinian metaphysics, may well have hastened his departure from France in 1628. In short, Bérulle may have informed him that he was no longer welcome in official circles. After all, Descartes was allied with the Jesuit-Hapsburg cause, which was at odds with the anti-Hapsburg position of the powerful Richelieu and the influential Bérulle, supporter of the Catholic League (Watson 2003, 147–51; Grayling 2005, 133–39).

What is important, however, is to understand the implications of this metaphysical shift. It is widely thought that Descartes, even from an early date, was concerned to ground his physics in metaphysics (Garber 1992, 280–93; Gilson 1951, 163–68; Hatfield 1986, 61–62; Hatfield 2003, 15–17; Schmaltz 1997, 49–50). Certainly Descartes's reference in the Mersenne letter to a treatise on metaphysics bears this out. In our view, however, it's not entirely clear what "metaphysical grounding" means for Descartes in this early period. It may well be that he thought the principles employed in *The World* provide the necessary metaphysical grounding, since he began to work on it in the early 1630s, not long after his correspondence with Mersenne. The metaphysics that we find in *The World* restricts itself to an appeal to a transcendent being—in Descartes's case, God—whose existence and creative power is separate from the things of nature. Certainly, there's no sign in *The World* of the metaphysics that comes to fruition in the *Meditations*, a metaphysics based on the establishment of the inner certitude of his own existence as the ultimate certainty. Furthermore, since the treatise on metaphysics has not survived, we have no way of knowing the extent to which it embraced a "*Meditations* style" metaphysics (if such was the case), or of knowing how far Descartes's metaphysical speculation had advanced in the period in which *The World* was composed. The possibility cannot be discounted, of course, that his views on eternal truth (as outlined to Mersenne in 1630) were part of, or were rooted in, the early metaphysical treatise. This supports the conjecture that Descartes may have articulated, at least in part, an account of innate ideas in relation to knowledge of the human self and its dependence on divine omnipotence. Part IV of the *Discourse* does list many metaphysical commitments that will become (in developed form) the central doctrines of the *Meditations*, including an early version of the first proof for God's existence in *Meditation* III, which in a letter to Mersenne in 1637 Descartes claims to have worked out in the treatise on metaphysics (c. 1628) (AT 6:31–36; CSM 1:126–29; AT 1:350; CSMK 53). But significantly, the *Discourse* lacks any discussion of skepticism or the evil genius hypothesis, so essential to the programmatic structure of the *Meditations*.

Moreover, it remains an open question how continuous the early metaphysics is with what appears in the *Meditations*. As the letters to Mersenne and Silhon in 1637 make clear, Descartes did not think that his manner of presenting his metaphysical views in the *Discourse* was ade-

quate (AT 1:350, 354; CSMK 53, 55). He puts this down to the exigencies of composition, and the character of the audience he wishes to reach; but we cannot dismiss the possibility that he had yet to put his views together with the necessary, dialectical clarity so evident in the *Meditations*. In short, while various metaphysical arguments existed in various forms, they may not have been fashioned into a consistent and self-contained metaphysics, sufficient from Descartes's point of view to ground the physics that he develops in *The World*. It is well to note in this regard that Descartes goes out of his way in 1640 to stress how essential it is, for understanding his thought, to grasp the integrated and meditative structure of the arguments of the *Meditations* (letter to Mersenne; AT 3:266–67; CSMK 163–64). We will return to the issue of the early metaphysics below. But most importantly, as we hope to show, what Descartes presents in *The World* is not what he thought, nor what he argues for, in the *Principles*, which fall into the period after which he has decisively made his metaphysical and epistemic turn.

The World

In *The World*, or as it is called when it is published, *Le Monde de Mr. Descartes ou le Traité de la Lumière* (1664), Descartes continues to uphold, though in a rhetorically odd way, the position that our knowledge is about the real, essential properties of bodies and that motion is based in the simple natures of bodies. At this point it is well to note that there is a special problem in dealing with Descartes's *World*. It was not published until 1664, some fourteen years after Descartes's death, and this is the text with which we work. In November 1633, Descartes writes to Mersenne saying that he has learned about the condemnation of Galileo by the Holy Office of the Inquisition for publishing his *World System*, as Descartes calls it, and that this will cause him to suppress publication of his work. Descartes, in *The World*, like Galileo, claims that the earth moves. So in his letter to Mersenne he writes, "I must admit that if the view is false [that the earth moves], so too are the entire foundations of my philosophy, for it can be demonstrated from them quite clearly. . . . But for all the world I did not want to publish a Discourse in which a single word could be found that the Church would have disapproved of, so I preferred to suppress it rather than publish it" (November 1633; AT 1:270; CSMK 40–41). Still, at the end of the letter he tells Mersenne to "allow me a year's grace so that I can revise and polish it." Later in 1635 he tells Mersenne again that "after Galileo's condemnation I revised and completed the treatise [*Optics*] I had begun some time ago. I have detached it completely from *The World*" (June or July 1635;

AT 1:322; CSMK 49). All of this seems to indicate that publishing *The World* is still an option for Descartes, and we can presume that he is still at work revising it.

In 1637, when Descartes beseeches Mersenne to obtain a license for him to publish his *Discourse*, which by then has been completed, he writes: "it seems you are afraid that the publication of my opening *Discourse* may commit me never afterwards to publish my *Physics* [his *World*]. You need not be afraid of that, because I do not anywhere promise never to publish it during my lifetime . . . if the reasons which prevent me from publishing should be altered, I could make a fresh resolve, without thereby being inconstant; because when a cause is removed, its effect is removed. . . . I spoke of my *Physics* as I did solely in order to urge those who want to see it to put an end to the causes which prevent me from publishing it" (May 1637; AT 1:368; CSMK 57). Descartes is here referring to Parts V and VI of the *Discourse*, in which he reports what is in his *World*, but in the *Discourse* he says only that "certain considerations prevent me from publishing" (AT 6:41; CSM 1:132) and that he wants to avoid confrontation and argument.

Later that year, in October 1637, Descartes writes to Christian Huygens, "I have even laid aside all work on my *Monde*, so that I shall not be tempted to put the finishing touches to it" (October 6, 1637; AT 1:434; CSMK 66). Five months later, writing this time to Constantine Huygens, Descartes despairs that "I cannot yet see any hope that I shall be able to give my *Monde* to the world in the near future" (March 23, 1638; AT 2:50; CSMK 92). He refers again to his *Monde* in February 1639 (letter to Mersenne, February 20, 1639; AT 2:525; CSMK 134) and later in two letters (letters to Florimond Debeaune and to Huygens in April and June 1639; AT 2:544, 552; CSMK 136). In the latter, he says, "I think that my *Monde* is the sort of fruit that cannot be picked too late, and should be left to ripen on the tree . . . I would not fail to publish it if there should be some advantage in it for me" (June 6, 1639; AT 2:552–53; CSMK 136). Still later in 1640, he continues talking about his *Monde* and the theory of the tides contained therein (letter to Mersenne, August 6, 1640; AT 3:144; CSM 3:151). Only in November 1640 does Descartes mention "a complete textbook of my philosophy" (letter to Mersenne, November 11, 1640; AT 3:157; CSMK 157). This signals an important change in intention away from completing his *World* to writing the *Principles of Philosophy*. But, it is important to note, this intention is formed *only after* the *Meditations* is already written and he has begun to collect and answer objections.

The point we emphasize in making these citations is to show that Descartes did not give up working on his *World*, even though he refused to publish it. This suggests strongly that the text we have is the result

of many years' work and the fruit of many revisions. Furthermore, it clearly follows, it is hard to date any given part of it. But if we have to assign it to a period, it should be dated in the late 1630s rather than 1633, and should not be considered a work completed and set aside prior to the *Discourse*. Further evidence for major revisions to *The World* appears in 1638, when Descartes, in reaction to criticisms of his views on subtle matter by Jean-Baptiste Morin, changes the diagrams in *The World*. This is five years after the date at which he is standardly said to have abandoned it!

Rosaleen Love (1975) has demonstrated the reasons for this change: "Descartes altered the form of the 1633 version [of *The World*] in order to incorporate into it some suggestions made by the theologian Jean-Baptiste Morin in 1638." In her view, this means that the version of the *World* published in 1664 "cannot be taken as the version which Descartes had ready for publication in 1633" (Love 1975, 128). In corresponding with Descartes, Morin argues that *The Optics* and *The Meteorology* (1637) are inconsistent in two respects: how can Descartes maintain that the subtle matter is a plenum if in *The Meteorology* its parts are spherical and leave room for a void; and how can the sun be said to be the cause of the subtle matter's motion when in *The Meteorology* the subtle matter itself is said to be in continual motion? (For details of Descartes's response to Morin, see his letter of July 13, 1638; AT 2:197–218; CSMK 106–11.)

Love also shows that Descartes revised the 1633 *World* further by incorporating, in modified form, two diagrams first drawn by Morin to illustrate difficulties in Descartes's position. The second diagram challenges Descartes's claim, in *The Optics*, that light is transmitted by rays that are exactly straight (AT 2:300). Descartes modifies Morin's diagram, and it becomes the "tube" diagram that he adds to *The World*, together with the admission that the parts of the second element, which transmit light, need not be placed upon one another in absolutely straight lines (AT 2:412). Here we have further evidence that Descartes refined his ideas between 1633, when he refused to publish *The World*, and the appearance of the *Principles* in 1644. Thus, the version of *The World* that has come down to us with the addition of the 1638 diagrams does not indicate the theory of matter Descartes had accepted earlier. Yet it does show that in the late 1630s Descartes is still a realist concerning different kinds of particles of matter, a position he will have modified before the time of the publication of the *Principles*.

The World cannot be seen, then, as a clear instance of Descartes's early thinking. But this makes it a more interesting document since, whatever its date, it indicates that at that time Descartes has not yet reached his mature position. Descartes begins his unpublished *World* by considering the nature of light and the role it plays in sensation. He develops a familiar

theme that will become epistemologically more fruitful in the *Meditations*. He asserts, "In putting forward an account of light, . . . it is possible for there to be a difference between the sensation (*sentients*) we have of it . . . and what it is in objects that produces that sensation in us (*les choses qui les produisent*)" (AT 11:3; G 3). He then introduces for the first time an important analogy he will use later: "the fact that words bear no resemblance to the things they signify (*signifient*) does not prevent them from causing us to conceive of those things, often without paying attention to the sounds of the words or to their syllables" (AT 11:4; G 3–4). He elaborates this claim in a way that highlights the mind's action as well as the material object's. "[I]t is our mind that represents to us the idea of light each time the action that signifies [*signifie*] it touches our eye" (AT 11:4; G 4). This epistemic point about perception and sensation is used to lead his reader into an analysis of the nature of light, namely, that light is the motion of certain types of particles.

This line of thinking is developed in the claim that there are three types of basic particles or basic elements (chapter 5; AT 11:24; G 17). First is the element of fire, "as the most subtle and penetrating fluid in the world" (AT 11:24; G 17). Second is the element of air, "a very subtle fluid in comparison to the third, but . . . we need to attribute some size and shape to each of its parts" (AT 11:25; G 17). Then finally, he says, "Beyond these two elements, I accept only a third, namely that of earth. I judge its parts to be proportionately larger than and more slowly moving than those of the second . . . it is enough to conceive of it as one or more large masses, whose parts have very little or no motion that might cause them to change position with respect to one another" (AT 11:25; G 17–18).

We quote this section at some length for two important reasons. First, it's clear that Descartes conceives these particles in a very realistic manner, and that they have motion as a property of their nature. This, in the context of his physics, is the development of Descartes's idea of simple natures that he sets out in the *Rules*. He is, it seems, establishing himself as a corpuscularian. This is a strong position, since in an earlier chapter the possibility of a void is not yet ruled out, something he will do hypothetically later in this work, and most emphatically in the *Principles*. "I do not want to say categorically that there is no void in Nature" (AT 11:20; G 15). In other words, although he sketches putative explanations of things that avoid positing a void, he leaves its existence an open possibility. The second point is more difficult to describe and creates a problem that arises in regard to *The World* and the *Principles*. It is clear in chapter 5 of *The World* that Descartes is making ontological claims, but this contrasts in a bizarre and emphatic way with what he goes on to do in chapter 6. There he wants to describe "another, wholly new world (*nouveau Monde*)" (AT 11:31; G 26). This is a world constructed according to our suppositions.

We may imagine "this matter as we fancy, [so] let us attribute to it, if we may, a nature in which there is absolutely nothing that everyone cannot know as perfectly as possible" (AT 11:33; G 22). So here Descartes postulates an imaginary world according to which we know natures absolutely and perfectly. This is both an ontological and an epistemological claim.

Obviously one needs to ask what Descartes is doing in constructing this imaginary world, and why he uses the ploy of imagination. Something like this will appear again, though with significant differences, in the *Principles*, Part III, article 44 (AT 8.1:99; CSM 1:255). There he will include, for epistemic reasons, the three types of particles or elements within the scope of his suppositions or hypotheses. So the contrast is between real particles in *The World* and hypothesized particles in the *Principles*. Roger Ariew thinks there is really no shift (2005). He believes that the fable of *The World* has the same form as hypotheses used by astronomers, and that the hypotheses of the *Principles* merely continue to reflect this practice. Daniel Garber calls this shift in the status of the corpuscular substructure, and how it is known, a "radical change" in Descartes's views (2001, 112). For Garber, Descartes moves from "the position that we can have genuine certain knowledge of the corpuscular substructure, to the rather different view that our conjectures about corpuscular substructures are at best devices that enable us to predict future experience" (2001, 113). We agree with the core of Garber's claim, but think that the change is more radical. Certainly, as Garber argues, one reason for Descartes's shift is that by the time of the *Principles* he realizes that complete a priori knowledge of the individual particles that constitute the matter of the world is not possible, yet he needs to be able to refer to differently sized and differentially moving particles to explain gravity and other physical properties. He explains in *Principles* III, 46:

> From what has already been said we have established that all the bodies in the universe are composed of one and the same matter . . . moreover, the same quantity of motion is always preserved in the universe. However, we cannot determine by reason alone how big these pieces of matter are, or how fast they move, or what kinds of circles they describe. Since there are countless different configurations which God might have instituted here, experience alone must teach us which configurations He actually selected in preference to the rest. We are thus free to make any assumptions on these matters with the sole proviso that all the consequences of our assumptions must agree with experience. (AT 8.1:100–101; CSM 1:256)

It becomes clear in the *Principles* that intuitive abstraction from experience (*pace* the *Rules*) is not possible, since simple natures such as the particular sizes, the shapes, and the definite configurations of particles

that make up the physical world cannot be directly intuited in accordance with the procedures of the *Rules*. So we must argue by supposition, which can then be confirmed or disconfirmed by experience. Furthermore, we are epistemically limited with respect to what we can derive by reasoning from our concepts regarding what it is possible to know about the workings of nature, so again we must make suppositions. All of this, as well as Descartes's rejection of his early aim of establishing sensory-related knowledge by means of intuition and abstraction, must be understood within the larger framework of the principles of causal harmony and epistemic teleology that emerge in *Meditation* VI, as we will endeavor to show.

But for the moment let's return to the text and consider the nature of Descartes's suppositional construction in *The World*. He begins by talking about matter, and says we should conceive it as "a real perfectly solid body, which uniformly fills the entire length, breadth, and depth of this great space in the midst of which we have brought our mind to rest. Further, let us suppose that God does divide it [matter] into . . . parts . . . and let us think of the differences that He creates as consisting wholly in the diversity of motions He gives to its parts. From the first instant of their creation, He causes some to start moving in one direction and others in another, some faster and others slower (or even, if you wish, not at all); and he causes them to continue moving thereafter in accordance with the ordinary laws of nature" (AT 11:34; G 23).

This is a very realistic picture of space, matter, and motion presented in a hypothetical and imaginary manner. It's important to note that the indefinite material world, which consists of moving parts, is imagined by Descartes to exist *in* a preexisting space. In other words, the universe is conceived to be a container in which matter is situated, a view suggested by Descartes's earlier example of the wine cask. He tells us that the wine cannot flow from an unstopped hole in the cask unless a vent is provided that allows the air to take its place "because outside everything is completely full, and the part of the air whose place the wine would occupy if it were to flow out can find nowhere else in the universe to occupy, unless an opening is made in the top of the cask through which the air can rise in a circle into its place" (chapter 4; AT 11:20; G 15). Clearly Descartes still entertains a distinction between space and what it contains, which indicates that he has not made (at least in *The World*) a principled identification of material extension with spatial extension, a doctrine essential to the physics of the *Principles*. It is not surprising, then, that the wine cask example doesn't appear in the *Principles*. There Descartes reconceptualizes space, and the cask example, which turns on the distinction between container space and what is contained, is no longer relevant (Palmer 1999, 2–3). It is well to note, however, that Descartes identifies

body and extension in Rule 14. We are told that the statement "Body is extended" is equivalent to "That which is extended is extended." According to Descartes, extension is here inseparable from the entity "body" and cannot "be conceived apart from [that] subject" in the imagination. This contrasts with the statement "Paul is wealthy," the content of which is very different from saying, "The wealthy man is wealthy." If we fail to notice this difference, Descartes claims, "we make the mistake of thinking that extension contains something distinct from that which is extended, in the same way as Paul's wealth is distinct from Paul" (AT 10:444; CSM 1:60). There is nothing in this line of argument, however, that indicates that Descartes has moved to the strict *in re* identification of extension, space, and material substance with external and internal place, a view central to the systematic development of the *Principles*.

But now we need to look more closely at the laws of nature that pertain to the moving parts of the universe, since the contrast with what comes later is striking. Intriguingly, Descartes states: "For God establishes these laws in such a marvelous way that even if we suppose He creates nothing more than what I have said, and even if He does not impose any order or proportion on it but makes it of the most confused and muddled chaos . . . the laws of nature are sufficient to cause the parts of this chaos to disentangle themselves and arrange themselves in such a good order that they will have the form of a most perfect world" (AT 11:34; G 23). Here the picture of God's action in creating and sustaining the material world contrasts strongly with the picture found in the *Meditations* and in the *Principles*. In these later works, Descartes speaks of the continual creation of the world from moment to moment and, as we shall argue in chapters 3 and 4, utilizes an enriched and nuanced version of efficient causation. In *The World*, the laws of nature are autonomous such that, once God has put everything into motion, the world will continue on its own. Moreover, since the world's development follows the laws of nature, things will sort themselves out into "a most perfect world."

Descartes elaborates his view of the autonomy of the laws in the subsequent chapter, 7. He puts forward a conservation principle: "that God continues to preserve it [matter . . . and the totality of qualities . . . attributed to it] in the same way he created it" (AT 11:37; G 25). Yet "it necessarily follows from the mere fact that he continues to conserve (*conserve*) it thus that there may be many changes in its parts that cannot . . . properly be attributed to the action of God, because this action never changes, and which I therefore attribute to Nature" (ibid.). He tellingly elaborates this: "among the various qualities of matter we have supposed that its parts have had various different motions from the moment they were created, and furthermore that they all touch one another on all sides, without there being any void. . . . From this it follows necessarily that from the

time they begin to move, they also begin to change and diversify their motions by colliding with one another. Thus, while God subsequently conserves them in the same way He created them, He does not conserve (*conserve*) them in the same state. That is to say, if God always acts in the same way and consequently always produces the same effect, many differences in this effect occur as if by accident" (AT 11:37–38; G 25). He closes this section by saying that he will not go further into "these metaphysical considerations," but will present "two of the three principal rules by which we must believe God to cause the nature of this new world" (AT 11:38; G 25).

Descartes's first rule for his new world is a version of his "inertial" principle: this is "that each particular part of matter always continues in the same state unless collision with others forces it to change its state" (AT 11:38; G 25). Descartes elaborates his conception of motion in an interesting way by saying there is no one who does not believe in the truth of this principle with respect to "size, shape, rest and a thousand other things." That is, he claims that everyone believes these properties are constant, and remain as they are unless some external force changes them. "But the Philosophers have exempted motion from it, which is the one thing I most explicitly wish to include" (AT 11:38; G 26). At this point Descartes contrasts the Scholastic definition of motion, as *motus est actus entis in potentia, prout in potentia est* (motion is the action of an entity's potential, insofar as it has that potential) with his own. He has already in the *Rules* attacked this Scholastic definition as nonsensical. But here he elaborates his own conception of motion by aligning it with the geometers, "who among all men are the most concerned to conceive the things they study very distinctly . . . [and they] have judged it [motion] simpler and more intelligible than the nature of surfaces and lines" (AT 11:39; G 26). So again, at this point in his thinking, Descartes has a concept of motion that is real, ontologically fundamental, and intuitively knowable by the mind. This is further supported by a declaration he makes in chapter 3 of *The World* in which he discusses the hardness and fluidity of bodies. He says that "virtue or power of self-movement (*la virtu ou la puissance de se mouvoir soi-mêsme*) found in one body may indeed pass wholly or partially into another and thus be no longer present in the first; but it cannot entirely cease to exist in the world" (AT 11:11; CSM 1:85). Here Descartes is not merely claiming that bodies communicate motion to one another through spatial contact. He is saying that they possess an internal power according to which they are able to move themselves and, as well, bodies that are adjacent to them.

He continues in chapter 7 by presenting his second and third rules (even though he said he would present only two). Again, he speaks about real motions and the giving of motion from one body to another. "My second

rule [is] that when one of these bodies pushes another it cannot give the other any motion except by losing as much of its own motion at the same time" (AT 11:41; G 27). This again is justified by a conservation principle, phrased in terms of God's retaining or transferring motions among the parts of matter (AT 11:43; G 29). His third rule is "when a body is moving, even if its motion most often takes place along a curved line . . . each of its parts individually tends always to continue moving along a straight line" (AT 11:44; G 29). He goes on, "This rule rests on the same foundation as the other two, and depends solely on God's conserving everything by a continuous action, and consequently on His conserving it not as it may have been some time earlier but precisely as it is at that very instant He conserves it" (AT 11:44; G 29–30). The new introduction of "the instant" is significant. It indicates that God's conservation of motion results in the tendency of bodies to move along a straight line (because that is the most simple). Finally, Descartes gives us a version of God's primary causality concerning motion. "God alone is the author of all the motions in the world in so far as they exist and in so far as they are straight, but that it is the various dispositions of matter that render the motions irregular and curved" (AT 11:46; G 30).

We will end our treatment of *The World* at this point, but will return to it in detail in chapter 4. Yet some important themes are worth emphasizing. First, Descartes is a corpuscularian who hasn't committed himself strongly (though he does to some extent in the fable section) to the anti-atomist position that there is no void. This suggests again that he may not have established a consistent set of metaphysical and epistemological principles. He seems to have no way of providing ontological arguments for the existence of the three types of basic particles, nor of arguing categorically against a void. Moreover, he seems to lack the epistemological foundations on which to base such arguments. Providing such foundations will become his concern, to some extent in the *Discourse*, but later and more searchingly in the *Meditations*. This may be a major reason why so much of *The World* is put into fable form, a form reminiscent of Plato's *Timaeus* and its likely story of the world's creation by the action of the Demiurgos. What better way to prevent possible criticisms than to put your position forward as only a possible way according to which things might work? However, the stratagem of a possible world cannot apply to the basic corpuscular theory, for this occurs before Descartes invokes his new world posited in the fable mode. Nor can the invocation of the new world apply to his equivocation concerning the void, as it too appears before he describes his new world. Presumably the corpuscular theory articulated is one that Descartes took over from Isaac Beeckmann, during his early days of scientific work (1618; AT 10:77). And presumably he sees no clear alternative at this stage in his thinking. Writing in 1637

to Plempius (Vopiscus-Foruntatus Plemp) for Fromondus (Libert Froidmont), who had objected to things in his *Meteorology*, Descartes writes: "If my philosophy seems too 'crass' for him, because, like mechanics, it considers shapes and sizes and motions, he is condemning what seems to me its most praiseworthy feature . . . I mean that in my kind of philosophy I use no reasoning which is not mathematical and evident, and all my conclusions are confirmed by true observational data . . . I am surprised that he does not realize that the mechanics now current is nothing but a part of the true physics which, not being welcomed by supporters of the common sort of philosophy, took refuge with the mathematicians. This part of philosophy has in fact remained truer and less corrupt than the others, because it has useful and practical consequences, and so many mistakes in it result in financial loss. So if he despises my style of philosophy because it is like mechanics, it is the same to me as if he despised it for being true" (October 3, 1637; AT 1:421; CSMK 64).

The major lesson to take from this appears to be that Descartes has no fully developed philosophical position for justifying his claims in *The World*. Certainly, as we've noted, he had embarked on a metaphysical treatise in 1628. But given that a metaphysical grounding in the manner of either the *Meditations* or the *Discourse* appears nowhere in *The World*, it doesn't seem unreasonable to assume that Descartes had not sufficiently developed his metaphysical thinking in that direction. Alternatively, he may have thought that a full-blown metaphysics of God, the self, and the world was unnecessary for justifying the project of *The World*. Although in *The World* Descartes evokes an ontology of simple natures, he is still working in the *method* tradition and has yet to shift to a systematic epistemology backed by metaphysical grounding as the means for justifying his natural philosophy. The emphasis on method is also present in the *Discourse* (Garber 2001, 33–51). It is justified, so Descartes claims, by its usefulness and its conduciveness to the practical benefits of life (Machamer 2000, 96–97). Later too, as noted above, Descartes will acknowledge that his metaphysics of God, which he regards as the necessary basis for his metaphysical thinking, is weakly expounded even in the *Discourse* (cf. letters to Mersenne, February 27, 1637; AT 1:620; CSMK 53; to Silhon May 1637; AT 1:353; CSMK 55). A second point to note about *The World* is that Descartes is a realist about motion in the sense that he takes it to be a fundamental property of physical things. Indeed, as we'll see shortly, motion, conceived as an active property of matter, is a doctrine he will not give up until *after* the *Meditations*.

To get an initial feel for Descartes's shift in his conception of matter, let's jump ahead and look at what he says after the *Meditations*, at the time he is working on his textbook, *Principles of Philosophy*. (See the letter to Mersenne, December 31, 1640; AT 3:276; CSMK 167.) In 1643,

he writes to Mersenne: "I do not believe there are in nature any real qualities, attached to substances and separable from them by divine power like so many little souls in their bodies. Motion, and all other modifications of substance which are called qualities, have no greater reality, on my view, than is commonly attributed by philosophers to shape, which they call only a mode and not a real quality. My principal reason for rejecting these real qualities is that I do not see that the human mind has any notion, or particular idea to conceive them by; so that when we talk about them and assert their existence we are asserting something we do not conceive, and doing something we do not understand. . . . Since motion is not a real quality but only a mode, it can only be conceived as the change by which a body leaves the vicinity of some others" (April 26, 1643; AT 3:648–49; CSMK 216). This is the first occurrence we have found of Descartes's explicit rejection of the doctrine of accidents and real qualities in favor of an ontology of modes and, as a consequence, the rejection makes a significant shift to motion conceived simply as a relational mode, that is, as a transference of a body from one adjacent vicinity to another, notions that will be central to the ontology of the *Principles*.

The *Discourse on Method*

But we are moving too quickly. Let's step back chronologically, and take a brief look at the *Discourse*. More accurately, this work, published in June 1637, is entitled *Discourse de la Méthode pour bien conduire sa raison, et chercher la verité dans les sciences. Plus la Dioptrique, les Meteores et la Geometrie qui sont des essais de cette Methode*. Descartes commences the *Discourse* by recounting autobiographical, first-person reflections that lead him to claims about method very similar to the *Rules*. He makes much of clearing his mind, ordering problems, and doing things in the systematic manner of the mathematicians. But he's still concerned with proper method as that which "instructs us to follow the correct order, and to enumerate exactly all the relevant factors, [and] contains everything that gives certainty to the rules of arithmetic" (Part II; AT 6:21; CSM 1:121). In Part IV, he introduces some metaphysics and epistemology and presents doctrines later developed in the *Meditations*. He mentions the method of doubt, the cogito, and the existence of God in a short compass of five or so pages (AT 6:32; CSM 1:127). Then in Part V he summarizes some of the things he has done in his *World*, and in Part VI he explains why he did not publish it.

There are two points that need comment in regard to the *Discourse*. First, it is notable that Descartes repeats almost verbatim the claim made in *The World* that nature organizes itself under the laws of motion and

what we can know about that organization, but this time he doesn't appeal to the guise of a fable. In so doing he refers to God's act of creation, which will be developed differently when he has thought through the new foundational position that first appears in the *Meditations*, according to which God re-creates the world in each of the independent parts of time. He says in *Discourse* V:

> Yet I did not wish to infer from all this that our world was created in the beginning the way I proposed [Descartes's likely-story rhetoric], for it is much more likely that from the beginning God made it just the way it had to be. But it is certain, and it is the opinion commonly accepted among theologians, that the act by which God now conserves it is just the same as that by which he created it. So, even if in the beginning God had given the world only the form of a chaos, provided that he established the laws of nature and then lent his concurrence to enable nature to operate as it normally does, we may believe without impugning the miracle of creation that by this means alone all purely material things could in the course of time have come to be just as we now see them. And their nature is much easier to conceive if we see them develop gradually in this way than if we consider them only in their completed form. (AT 6:43; CSM 2:33–34)

It is clear that Descartes is changing the likely-story strategy as it is found in *The World*. Specifically, he here attributes the world's emergence from chaos to a theological doctrine of creation that he says is one the theologians commonly accept. In the beginning there were only simple natures, and God, having established the laws of nature, allows them to combine those simples into the complexes we observe in the world. In other words, God produces the complexes of nature *indirectly* through the operation of nature's laws. In *The World* and the *Discourse*, the laws of nature work in this manner without God's continual and active involvement in nature, but this conception is nowhere present in the *Principles* (1644). Indeed, in Part III of the *Principles* Descartes explicitly revokes the view that the world may have began from a primitive chaos and from there moved to a cosmos under the guidance of the laws of motion alone: "I once undertook to provide such an explanation. But confusion seems less in accordance with the supreme perfection of God the creator of all things than proportion and order; and it is not possible for us to have such a distinct perception of it." In other words, Descartes now holds that it is a greater testament to God's omnipotence that the world be conceived as emerging directly from primordial particles "initially equal in respect of both their size and their motion" rather than from a disproportionate chaos (AT 8.1:103; CSM 1:257). But a deeper conceptual movement is involved. As

we hope to show, this shift gestures to an important change in how Descartes views God's causal relation to the created world. It denotes a movement away from the causal conservationism of *The World* to the causal re-creationism of the *Meditations* and the *Principles*.

The second point to notice is that Descartes, for the first time, refers to the concept of substance in Part IV of the *Discourse*. After establishing the nature and consequences of the cogito, he observes: "From this I knew I was a substance whose whole essence or nature is simply to think, and which does not require any place, or depend on any material thing, in order to exist. Accordingly this 'I'—that is, the soul by which I am what I am—is entirely distinct from the body, and indeed is easier to know than the body, and would not fail to be whatever it is, even if the body did not exist" (AT 6:33; CSM 1:127). This passage affords insight into the sort of ontology Descartes had established either in the "little treatise" (his metaphysical turn of 1628) or had developed subsequently. He tells us that in the face of doubt we can establish the truth "I am thinking, therefore I exist. But if in thinking necessarily I exist, it follows that I am something, viz., that I am, in essence, a thinking thing or substance" (ibid.). What he tells us here in regard to substance foreshadows, in broad outline, his later mature account. But he has yet to articulate a principled account of the nature of substance, and yet to establish a philosophical vocabulary by which to talk about it. For example, it seems that the distinction between substance and mode, on which his mature ontology rests, is not even considered. Moreover, at this time, it is not clear whether he has formulated the view that substance is defined by its principal attribute, the basis on which the real distinction between mind and body is established in the *Meditations*. What is clear, however, is that he has moved beyond the ontology of natures intuited by abstraction, an ontology fundamental to the methodology of the *Rules*.

Above we gave a general account of Descartes's comments to Mersenne and Silhon regarding the philosophical defects and shortcomings of the *Discourse*. What he singles out in three letters (two in 1637 and one in 1638) is discontent with his treatment of divine existence and the nature of soul. It will be instructive to quote what he says to these scholars, since it provides some indication of where he may have arrived in his metaphysical reasoning. Awaiting the publication of the *Discourse* and its essays, Descartes writes to Mersenne in February 1637 to say that he intentionally did not elaborate his proof for the existence of God or his argument for the distinction of the soul from the body. "I left this out on purpose and after deliberation, mainly because I write in the vernacular. I was afraid that weak minds might avidly embrace the doubts and scruples I would have had to propound, and afterwards been unable to follow as fully the arguments by which I endeavored to remove them." He goes

on, "Eight years ago, however, I wrote in Latin the beginnings of a treatise of metaphysics in which this argument is conducted at length; if a Latin version of my present book is made, as is planned, I could have it included" (AT 1:361; CSMK 53).

A few months later, in May 1637, Descartes again admits the presence of this defect in his work, but with a slightly different excuse. "I agree, as you observe, that there is a great defect in the work you have seen [the *Discourse*], and that I have not expounded, in a manner that everyone can easily grasp, the arguments by which I claim to prove that there is nothing at all more evident and certain than the existence of God and of the human soul. But I did not dare to do so, since I would have had to explain at length the strongest arguments of the skeptics to show there is no material thing of whose existence one can be certain" (letter to Silhon, May 1637; AT 1:353; CSMK 55). Again in February 1638, he writes to Vatier: "It is true I have been too obscure in what I wrote about the existence of God in this treatise on method, and I admit that although the most important, it is the least worked out section in the whole book. This is partly because I did not decide to include it until I had nearly completed it and the publisher was becoming impatient. But the principal reason for its obscurity is that I did not dare go into detail about the arguments of the skeptics or say everything that is necessary to withdraw from the senses . . . these thoughts did not seem suitable for inclusion in a book which I wished to be intelligible in part even to women" (letter to Vatier, February 22, 1639; AT 1:560; CSMK 85–86).

Despite his gender prejudices, it is clear that Descartes worries that his philosophy will not be understood. We conjectured above that at this stage he may have thought that his metaphysical arguments were insufficiently worked out. But now we can be more specific. There is an important philosophical conception missing from Descartes's proof for God's existence in *Discourse* Part IV, to which he refers in these letters. In the *Discourse* he embarks on the proof by saying that he wanted to inquire into an "ability to think of something more perfect than I was; and I recognized very clearly that this had to come from some nature that was in fact more perfect" (AT 6:34; CSM 1:128). But the proof that this perfect nature must be God invokes no aspect of the causal theory that provides the necessary framework of the elaborate version of the argument given in *Meditation* III. There, Descartes invokes a complex causal theory, involving relations among objective, formal, and eminent reality, in order to construct an account of how the content of the immediate idea he possesses of a perfect being has its unique source in an infinitely perfect being who exists apart from him. Certainly these concepts are present in the causal tradition that Descartes inherits, most notably in the works of Suárez and Eustachius a Santo Paulo. It is important to remember, how-

ever, that Descartes's argument for God's existence is very different from traditional causal arguments. It is based on the immediate fact of his own existence, the first truth that he can claim to know, and thus "does not depend on any chain of causes and is better known to me than anything else could possibly be. And the question I asked myself was not what was the cause that originally produced me, but what is the cause that preserves me at present" (*First Reply*; AT 7:107; CSM 2:77). Moreover, the argument in *Meditation* III turns crucially on the view that the objective being of an idea must have a cause. It is clear that the version of the argument in the *Discourse* lacks this essential causal framework. It is possible, then, that in 1637 Descartes had yet to link his levels-of-perfection ontology together with the support of a fully worked out causal theory. Sorting out these connections in the *Meditations* (1640–41) will be the first move toward the epistemic stance. By the spring of 1640, Descartes has a text of the *Meditations* finished. In May of that year he sends a copy of the manuscript to Regius (Henri le Roy) for comments.

We saw above that Descartes takes motion to be a real property of body. Let us note that this realist position concerning motion and the active powers of bodies is still present in the *Meditations*. The structure of what we will call the *causal realist argument* of *Meditation* VI rests on the traditional notion that an effect's reality derives productively from its cause, and that the cause must possess at least as much reality and perfection as the effect it produces. Here is Descartes's argument in full:

> Now there is in me a passive power (*facultas*) of sensory perception—of receiving and recognizing the ideas of sensible objects; but I could not make use of it unless there were in existence also something active (*quaedam activa*), either in me or in something else, which has produced (*producendi*) or brought about (*efficiendi*) these ideas. But this power (*facultas*) cannot be in me, since clearly it presupposes no intellectual act on my part, and the ideas in question are produced (*producuntur*) without my cooperation and often even against my will. So the only alternative is that it is in another substance distinct from me—a substance which contains either formally or eminently all the reality which exists objectively in the ideas produced (*productis*) by this power (as I have just noted). This substance is either a body, that is, a corporeal nature, in which case it will contain formally everything which is to be found objectively in the ideas; or else it is God, or some creature more noble than a body, in which case it will contain eminently whatever is to be found in the ideas. But since God is not a deceiver, it is completely obvious that he does not transmit (*immittere*) these ideas immediately and through himself, nor even with the help of some creature in which their objective reality

> is contained not formally but only eminently. For God has plainly given me no faculty at all for recognizing any such source for these ideas; on the contrary, he has given me a great propensity to believe that they are transmitted (*emitti*) by corporeal things. So I do not see how God could be understood to be anything but a deceiver if the ideas were transmitted (*emitterentur*) from a source other than corporeal things. Thus, corporeal things exist. They may not exist in a way that exactly comports (*comprehendo*) with my sensory grasp of them, for in many cases the grasp of the senses is very obscure and confused. But at least they possess all the properties which I clearly and distinctly understand (*intelligo*), that is, all those which, viewed in general terms, are comprised within the subject-matter of pure mathematics. (CSM 2:55; AT 7:79–80)

How are we to understand Descartes's reference to "something active" inherent in bodies external to him that produces in him ideas of sensible things if, as every commentator assumes, such bodies are essentially passive extension? And how do we explain the fact that the phrase "something active" is no longer used in the variant of the argument that appears in the Latin *Principles of Philosophy* of 1644 or in its French translation of 1647 (Part II, art. 1; AT 8.1:40–41; AT 9.2:63–64; CSM 1:223)? In the *Principles*' variant of the argument, Descartes states, in reference to extended matter: "we clearly understand this matter as being quite different from God and from ourselves and from our minds and we appear to see clearly that the idea of it comes (*advenire*) to us from things located outside ourselves to which it is altogether similar" (Part II, art. 1; AT 8.1:40–41; CSM 1:223). Descartes's language still preserves the causal sense that there's something external to the mind that produces or brings about the idea of body in the mind. Nevertheless, his terminology has shifted, in that he no longer speaks of an external "active power" that bodies may possess if they exist. But it would be a mistake to suppose that Descartes's use of the notion of "active power" in the *Meditations* is simply a convenient employment of Scholastic terminology that, for Descartes, had already degenerated into mere jargon. On the contrary: he is using this terminology in a major argument designed to show that an external world is the unique source for key beliefs that we are compelled to hold. Moreover, his use of "active power" in the *Meditations* fits what Descartes will call dismissively in the *Principles* the ordinary conception of motion, whereby it is conceived to be an "action by which a body travels from one place to another" (AT 8.1:53; CSM 1:233). The shift from the *Meditations* to the *Principles* is interestingly illuminated by Descartes's response to Burman, who asks, referring to the argument in *Principles*, Part II, article 1, whether the phrase "we appear to see clearly that

the idea of it comes to us from objects" signals a case of doubt. Descartes replies: "The reason I use that word is that someone may perhaps deny that we indeed see it. But in any case, what 'appears' to us is enough to prove what I want. For since what appears is the work of the mind and consciousness (*opus mentis et conscientiae*) what we 'see' must ultimately reduce to what 'appears' to us. And what appears to us in fact requires the existence of objects as a source of the ideas in question" (AT 8.1:41; CSM 1:223; Cottingham 1976, 34).

In his later work, Descartes places more stress on the active work the mind performs, without denying that the presence of particular objects on particular occasions is necessary for the mind to have the sensations and perceptions that it has. This relationship is made clear in the French translation of *Principles* II, article 1 (1647). There the phrase "l'idee [qui] se forme en nous a l'occasion des corps de dehors" is used (AT 11.2:64). This characterizes Descartes's late view of the active faculty of mind that is triggered on a particular occasion by the presence of bodily motions. We'll return to this issue in chapter 5 when we discuss Descartes's notion of innateness in *Notes on a Certain Program* (1648). It's important to keep in mind that, for Descartes, the contents of immediate awareness are not simply given; they need to be created as *mental* contents by the mind's active intentionality. Thus, as we'll see in chapter 6, the motions emitted by bodies are used by the mind's active powers to bring it about that the mind possesses sensory ideas that direct it to certain bodily features rather than to others. In Descartes's later thought, innate ideas play an increasingly important role (chapter 5) in his account of sensory awareness and contribute to a significant epistemic shift in his thinking. Describing this result will involve laying out Descartes's view that the mind is active (in a nonvolitional manner) in sensation, and the manner in which sensations have intellectual content.

This shift can be seen in the *Principles*. There he claims that by the use of intellect alone, "we shall perceive that the nature of matter, or body considered in general, consists not in being something which is hard, heavy, colored, or which affects the senses in any way, but simply in being something which is extended in length, breadth and depth" (Part II, art. 4; AT 8.1:42; CSM 1:224). Descartes refers here to what he will call in the early 1640s the *principal* attribute of substance. Prior to that time, even in the *Meditations*, he lacks a settled philosophical vocabulary for expressing the various features of things. However, probably while drafting Part I of the *Principles*, in late 1640, and wanting to make his philosophy appropriate for teaching in the schools, he strives to articulate his basic concepts in the fashion of the Scholastic texts he hopes to supplant. This demands that he give a principled account of substance, a task he had not previously undertaken. Thus, in *Principles*, Part I, article 53, he

states: "And a substance is indeed known by any attribute of it; but each substance has only one principal property which constitutes its nature and essence, and to which all other properties are related. Thus extension in length, breadth, and depth constitutes the nature of corporeal substance" (AT 8.1:25; CSM 1:210). And in article 56 he gives a systematic account of the distinction between mode and attribute, so fundamental to his new ontology of substance that emerges in the early 1640s. If extension expresses the essence of matter as its principal attribute, we may infer that matter is passive and inert. This obviously raises problems for the notion that motion is a proper property of bodies, and for the notion that bodies possess power or force as an essential part of what they are. In other words, matter, whose principal attribute or essence is extension, can cause nothing. This confronts Descartes with the need to provide a new definition of motion. Ironically enough, it turns out to have an Aristotelian ring—change of place—a view he had mocked in earlier writings. In Descartes's new definition, motion is not an action or force that causes transference. To attribute an action or force to matter would be to claim that it has active properties. But there is a secondary sense in which he wants to legitimate the use of terms like "force," "impulse," "tendency," or "inclination": this is how ordinary people speak about such matters, and Descartes doesn't want to depart too far from ordinary speech when explaining how the material world works. Thus, in the *Principles*, but not before, motion becomes transference relative to bodies that *we take* to be at rest. In other words, humans have the epistemic ability to conceive motion when they have the experience of something that is undergoing a relative change of place. This is one of the strongest arguments for the claim that Descartes is no longer dealing with the metaphysical simples of the *Rules* that he took the mind to be able to intuit through abstraction. In chapter 4, we will analyze this important shift by giving an account of God's action in regard to motion thus conceived. This will involve a detailed consideration of the development of Descartes's conception of efficient causality and the role secondary causes play in the mature world picture he presents in the *Principles of Philosophy*.

These issues raise important questions for our interpretation. According to the reading we advance in chapter 4, there are substantial differences separating *The World* and the *Principles*. This goes counter to the received view, which claims that the treatises differ only in detail rather than in substance. If, according to our interpretation, Descartes shifts from a conservationist to a re-creationist view of God's creative action in *Meditation* III, to claim that the *Principles* differs from *The World* merely in matters of style and detail seems implausible. Moreover, as we will note, Part II of the *Principles* is replete with epistemic qualifiers rooted in how we regard and conceive things relative to our perceptions

and conceptions. Certainly, the metaphysics of the *Meditations* is continuous in large measure with the metaphysical picture that Descartes presents in Part I of the *Principles*. Both works proceed from doubt and move via the cogito to God, and from God to the question of the existence of the external world. Nevertheless, the unmistakable presence in *Principles* Part II of claims rooted in what is epistemically viable relative to us, cannot be ignored or explained away, especially since they arise only at the end of *Meditation* VI and play no overt role earlier in the *Meditations* or elsewhere. So the question we explore in chapter 4 is the way in which the *Meditations* make a difference to the natural philosophy of the *Principles*.

However, there is another question relevant to this issue, namely, how to account for the differences between Descartes's metaphysics as presented in the *Meditations* and the version he lays out in *Principles* Part I. It is frequently claimed that these differences can be explained by the fact that the *Meditations* are written according to the analytic method, whereas the *Principles* are composed according to the synthetic method. Garber and Cohen show decisively that this ploy is a red herring (2001, 52–63).They argue that Descartes, though he had occasion to do so in a number of contexts, never characterizes the *Principles* as a synthetic work. Descartes presents and discusses a version of the analytic/synthetic distinction in the *Second Reply* prior to adding the geometrical appendix, which is a formal exposition, in the synthetic style, of some of the arguments of the *Meditations* (AT 7:155–56; CSM 2:115–20). We know from a letter to Mersenne in December 31, 1640, that Descartes begins to compose *Principles* Part I roughly at the same time he is at work on the geometrical appendix, which uses definitions, postulates, axioms, and proofs in the synthetic style. Clearly, the *Principles* are not constructed in accordance with this style of method or presentation. Furthermore, as Garber and Cohen point out, the writing out of the appendix would have afforded Descartes an ideal occasion to connect the *Principles* with the synthetic method if he thought they satisfied that format. He does not do so, although he says that the *Meditations* were written in the analytic mode of instruction (AT 7:156; CSM 2:111). Similarly, in the *Fourth Reply* to Arnauld, written shortly after the *Second*, he mentions the *Principles* while discussing work in progress, but again he doesn't link them to the synthetic method of presentation appended to the *Second Reply* (Garber and Cohen 2001, 60–61). Nor does he do so in the French translation of the *Second Reply* that appeared in 1647, three years after the first edition of the *Principles*, in which there are significant alterations to the section on analysis and synthesis probably written by Descartes himself. As Garber and Cohen point out, this again would have been a perfect opportunity to tell his readers that the metaphysics of the *Principles* is presented synthetically (2001, 61). In the light of these passages, it seems reasonable

to conclude that for Descartes the *Principles* are not constructed according to the synthetic method.

Thus, it seems to us unhelpful to explain the differences between the *Meditations* and the *Principles* in terms of a distinction that is foreign to Descartes's own conception of their relationship. This means, of course, that the relationship needs to be explained in another way. To some extent the differences can be accounted for by the fact that Descartes intended the *Principles* to function as a textbook that he hoped would emulate and certainly supplant the Scholastic textbooks of the period. So, not surprisingly, unlike the *Meditations*, the arguments of the *Principles* are explicitly structured in the manner and order reminiscent of the typical Scholastic textbook. But this in itself does not illuminate important internal differences between the two works, especially those evident in the "theoretical" Parts I and II of the *Principles*. To this end we'll consider what implications the re-creationist hypothesis adopted from the *Meditations* has for the *Principles*. This consideration, in conjunction with the development in the *Principles*, of the epistemic teleology of *Meditations* VI, provides deeper insight not only into the differences between the *Meditations* and the *Principles*, but also into the differences between the latter and *The World*. Also significant in this respect is the fact that Descartes gives the metaphysics contained in Part I of the *Principles* the title "The Principles of Human Knowledge" in both the Latin and the French editions. This raises an intriguing question: what does metaphysics mean for Descartes in this late period, especially since the metaphysics set forth in Part I of the *Principles* is the basis for the perspectivalist epistemology developed in the rest of the treatise? We'll consider these interpretative issues in chapter 4.

It is clear that many important shifts occur in Descartes's developing thought. In order to draw together the import of the claims we have made, and to provide a synopsis of where our study is going, we'll end this chapter by summarizing three of the most significant changes that we think are supported by the texts, and for which we hope to supply sufficient documentation in the chapters to come:

1. Although *The World* and the *Principles* share features in common, at bottom, they are conceptually far apart theologically, ontologically, and epistemically. In *The World*, Descartes is a strong conservationist. Under the remote superintendence of God's ordinary concourse, created things act causally according to their intrinsic natures and are the source of their duration and existence through time. In other words, God contributes to the actions of created things simply by creating and conserving them with their active powers, and in virtue of their own intrinsic agency they are able to bring about effects without God's direct and immediate

action. The *Principles* are strikingly different. In chapter 4, we will show, by examining *Meditation* III, that Descartes establishes, most probably for the first time, two significant doctrines: (*a*) that the parts of time are mutually, logically, and causally independent; and (*b*) that principle or *per se* efficient causes are *necessarily* simultaneous with their effects. This radical shift in his metaphysics powerfully affects the natural philosophy of the *Principles*. In the later treatise, Descartes moves from a conservationist position to embrace re-creationism, the view that God re-creates the world in each successive and independent part of time. According to the re-creationism of the *Meditations* and the *Principles*, divine conservation is no longer remote: now it is immediate and direct at each moment at which the world exists. Obviously, this raises the question whether the created world possesses genuine efficient causation, and whether Descartes is forced to accept some form of occasionalism. As we will show in chapters 2, 3, and 4, important changes in his conception of secondary efficient causation occur as his thought develops. In contrast to the received interpretation, which claims that *The Principles* are just *The World* having been taught "to speak Latin" (letter to Constantijn Huygens, 1642; AT 3:523; CSMK 210), what appears in 1644 tells a significantly different story.

2. As we'll argue in chapter 3, *Meditation* VI advocates, for the first time, a genuinely teleological conception of the representation of the senses. Descartes tells us that human beings have the sensations they do in order to preserve the mind-body union. The senses can't report the truth about the nature or essence of things: only the intellect can do that. Nevertheless, they provide the mind with a representation of what is harmful or beneficial for the survival of the mind-body union: "Concerning those things regarding the well-being of the body, I know that all my senses report the truth much more frequently than falsehood" (AT 7:89; CSM 2:61). Certainly, as Descartes argues, we can't know God's ends. Nevertheless, we can know that the world is constructed such that there is a "fit" between the way it is created and the manner in which our modes of cognition and learning operate. Thus, although the world is not created for us, it and we are created such that we can survive in it, and do so in a manner conducive to our ability to establish reliable knowledge of it: sensations are not only from but also *for* the mind-body system. We are not restricted, however, to establishing reliable sensory knowledge solely for our physical well-being. In the *Principles* Descartes develops a view that we call *epistemic teleology* that involves the establishment of scientific or theoretical knowledge. Thus, as we endeavor to show, Descartes's treatments of motion, its laws and conservation, and body-body causation are each articulated from an epistemic perspective that is irreducibly

teleological. This perspective, in connection with his causal harmony principle, results in what we call Descartes's epistemic stance.

3. Closely connected to these shifts are important developments in Descartes's theory of ideas, mind, and perception that we explore in chapters 5 and 6. As we have noted, there is an evident "empiricist" bent in his early thinking according to which some general notions are generated by abstraction from the particulars of experience. By the 1640s, Descartes thinks the method of abstraction is a negative procedure able only to produce an inadequate understanding of things, and in the *Replies* he develops what we'll call the *method of exclusion* according to which the nature of things can be understood directly and positively by intellectual reflection. His main example is the real distinction between mind and body, but this shift in his epistemic stance transforms his entire theory of mind, perception, and ideas. Significantly, innate ideas take on a greater importance. Concomitant with the shift away from abstraction to exclusion is the shift from establishing ideas, on the basis of inductive experience, to the epistemic process of bringing particulars, represented in experience, under the requisite general and innate ideas. We've indicated that Descartes's conception of innate ideas is nuanced and plays different sorts of contextual roles in his thought. Nevertheless, innate ideas, as an epistemic category, begin to play a fundamental role in Descartes's mature theory of mind and perception, and have an important place in the development of his epistemic teleology. As we'll see, innate ideas are formed, for Descartes, in the mind by the mind, are produced by an innate mental faculty not fully exercised at birth, and—with the notable exception of ideas of the self and God and a host of common notions—would count for nothing if various sorts of correlations with physical stimulation were absent. This is not to deny, of course, that the ideas of the self and God have contents that are connected causally to extramental metaphysical realities. Descartes's concern, that is, is not only with the idea of a self that thinks and the idea of God but with what those ideas are ideas of. In one way or another, these changes are all connected to Descartes's new theory of ideas that emerges around the period of the *Meditations*.

Chapter Two

GOD AND EFFICIENT CAUSATION

Descartes's conception of divine causation is a turning point in seventeenth-century thought. Without its impact, the causal theories of Spinoza and the occasionalists would not have emerged as they did. The use Descartes makes of tags, such as *nihil sine causa fit* or *ex nihilo nihil fit*, is novel, as is his way of mobilizing causal axioms such as "There is nothing in the effect not previously in the cause." Perhaps no seventeenth-century thinker stresses so emphatically the causal gap that exists between the perfection of God's infinitude and the finitude of created things. We call this Creator-created connection *vertical causation* to distinguish it from *horizontal causation*, which we use to characterize Descartes's understanding of causal relationships among created things. Descartes denies the received view of vertical causation. On this view, causes are arranged, under God's supervision, in causal chains according to hierarchical levels of essential and accidental subordination (Menn 2000 and Des Chene 2000). In Descartes's world, everything depends, without causal mediation, directly on God for its existence and its continuing in existence. This view of efficient causation Descartes connects, throughout his writings, to God's "inexhaustible," "immense," and "immeasurable" power (*Principles* I.21; AT 7:110; CSM 2:79; art. 40; AT 8.1:13–20; CSM 1:200–206). Efficient causation has wide explanatory scope for Descartes; it covers the existence of minds and bodies, eternal truths and essences, and the mode of being possessed by the "objective" content of ideas. Descartes's astonishing claim that God causes eternal truths scandalized his contemporaries, as did his view that the "objective" content of ideas possesses an *esse* (or being) that needs to be explained causally (Gilson 1951, 202–7; Armogathe 1995; Verbeek 1995). The first claim meets Mersenne's incredulity in corresponding with Descartes in 1630. The second is attacked by Johannes Caterus (Johan de Kater) and objected to by Pierre Gassendi in the *First* and *Fifth Objections* to the *Meditations*. More astonishing to his contemporaries is Descartes's belief that the cause of God's existence needs to be considered. This leads him to argue, in the *First* and *Fourth Replies*, that God can be considered the positive cause of himself. Not surprisingly, Descartes's view draws critical fire from Antoine Arnauld in the *Fourth Objections*. Interestingly enough, there is an inherent logic in

Descartes's position that leads him to ask, are there epistemic grounds for considering God's existence in terms of the notion of *causa sui*?

We discuss Descartes's treatment of God's vertical causation in this chapter with the aim of illuminating its stages of development. In this context, we consider the causal axioms guiding his mature thought, such as "Whatever exists in an effect is contained either formally or eminently in its cause." It seems, despite seminal work on Descartes's conception of efficient causality, that more needs to be done to establish his indebtedness to, and his break with, the traditional theory of the causes. This is especially so since Descartes rigorously restricts the activity of efficient causation to divine agency and derivatively to human action. For him, the creative act is grasped completely through the notion that God is the absolute and efficient cause of being, thus severing its ties to the nexus of formal and final causation. Equally novel is Descartes's conception of efficient causation in the material world. For Suárez, efficient causation is a privileged form of causality in the horizontal realm, but he continues to maintain its interconnection with formal and final causes. Descartes is more radical. For him efficient causation is more than a *primus inter pares* in the material world (from which he banishes the other causes): it is the only cause, and is thoroughly reconceptualized by Descartes. Thus, an important aim of this chapter is to provide a contextually nuanced analysis that will provide groundwork for understanding the emergence and implications of Descartes's views on vertical and horizontal causation. To set the scene we commence with some salient developments in the historical career of efficient causation.

A Historical Preamble

We begin with an outline of the background that leads—particularly through the mediation of Francesco Suárez—to Descartes's claim that God is the efficient and total cause of everything that exists. Conceptions of the cause of existence are ancient, and have philosophical roots in Greek thought, especially in Aristotle's. In the late Renaissance, interest in Aristotle's philosophy peaked, and innovative thinkers, such as Jacopo Zabarella (1532–89), Pedros Fonseca (1528–99), and Francesco Suárez (1548–1617), used philologically based and well-translated texts of his work in developing their philosophies (Schmitt 1983). We'll turn, then, to Aristotle's view of the causes, especially to his view of "efficient" causation, a term with a long and varied tradition (Carraud 2002, 68–77; Frede 1987, 125–50; Olivo 1997b; Gilson 1986, 167–121). In addition, we'll give a brief account of Avicenna's (980–1037) conception of divine causation, and his appropriation into theology of Aristotle's notion of efficient

causation. This appropriation is important for understanding how Descartes constructs his conception of divine causation. In the next chapter, we consider Neoplatonic views of causation in connection with Descartes's use of the "eminent containment" notion in articulating the causal perfections of divine nature. The notion that entities "contain" properties "eminently" is certainly obscure. Nevertheless, it lies at the heart of Descartes's views on divine causation.

Aristotle's *Generation and Corruption* is concerned with the coming to be and passing away of things in the natural world. Assuming his quadripartite view of causation, he argues that coming to be and passing away cannot be reduced to "alteration" or "association" or "dissociation," views current among his predecessors (1978, I.2, 314a1–316, 317a3–31). He distinguishes things that *unqualifiedly* come to be from those that *qualifiedly* come to be (I.3, 318a29–36): "for some things signify a 'this,' others a 'such-and-such,' others 'so-much.'" So things that don't signify substance "are not said to come-to-be without qualification, but to come-to-be something" (319a11–319). Clearly, Aristotle proposes to give a general account of what comes to be and passes away. Things of this sort are able both to be and not to be, since they can exist at one moment and later cease to exist (II.9, 335b2–4). In each case, a causal account can be given.

In book II, sections 9–10, Aristotle considers the sources of coming to be and passing away, and discusses the contribution each makes. He draws explicitly (II.3, 336a9–20) on his analysis of the causes in the *Physics* and the *Metaphysics*. Apart from the material and formal cause Aristotle speaks of, "whence [arises] the first source of change or rest, as the one who deliberates is responsible (*aitios*), and the father [is responsible for] the offspring, and in general what produces (*to poioun*) is for what is produced and the what makes a change (*metablētikon*) of what changes" (*Meta*. V.2, 1013a29–32, based on a translation by Christopher Kurfuss; for a similar statement see *Phys*. II.3, 194b29–32). The passage defines the "moving" cause, and the phrase "the first source" points to what is primarily responsible for a particular motion or change. In Aristotle's view, when we grasp the "first source" of a change or a nonchange, we grasp the reason why it occurs as it does. Thus the phrase refers to what it is that first initiates the change or nonchange. As such, a cause that is the "first source" is a cause *per se*, that is, a cause that a thing possesses "primarily of itself (*kath' hauto*), and not with respect to what is accidental" (*Phys*. 192b21–22). In the language of the Middle Ages, this is called a principal or a *per se* cause, one responsible, in virtue of its nature, for what occurs.

In *Physics* II.7, we are told that the "causes" are often interconnected in natural change. Referring to the form or essence (formal cause), the

that-from-whence-the-change-arises (efficient cause), and the that-which-the-change-is-for (final cause), Aristotle says these "last three often coincide. What a thing is, and what it is for, are one and the same, and that from which the change originates is the same in kind as these" (198a25–27). In other words, they fall under the same *logos*, namely, causal changes that are for something. So Aristotle's claim seems to be this: if the form is a source of change as an end, the end and the primary source of change coincide, since the latter's movement refers to what originates the change toward the end. Thus, the end is a source in that the natural change begins from what initially directs the change toward that end. The material cause is excluded, since it is the passive substratum of change. It is "that [thing] out of which something comes to be." For Aristotle, in any investigative situation, we should establish whether all four causal modes of inquiry are applicable to a process of change.

We'll see shortly that Suárez's arguments for subordinating the formal and final causes to the efficient interpret Aristotle's position and provide a basis that may have informed Descartes's view of the causes. Interestingly enough, in *Generation and Corruption* II.9–10, Aristotle accords a special status, as a cause of coming to be, to the "formal" and the "efficient" cause. He notes that the physician and the scientific man "implant" (*empoiei*) health and knowledge in a subject. Here Aristotle understands causation as an active phenomenon, which, by means of its activity, brings about an effect: "for that which alters or transforms is a *more* powerful cause (*aitiōteron*) of bringing things into being (*gennan*)" (II.9, 335b26–27). Aristotle generalizes this conception to the products of both nature and art: in regard to both it is what causes motion and change that is "the acting cause (*kinētikon*)." But what does something, does so not simply because it is an acting cause, but in virtue of being the "*most* powerful cause (*kuriōteran aitian*), since they [Aristotle's materialist opponents]) exclude the essential nature (*to ti en einai*) and the form (*morphēn*)"of the thing that acts (335b35–336a1). But, although he foregrounds the formal and efficient causes, Aristotle does not explicitly subordinate the material and final causes to the efficient.

Aristotle gives telling examples of what initiates change: the "deliberator," the "father," the "doer," and the "seed" are each the prior sources of the changes they produce. He brings these particular causes under the class of things that do something and the class of things that are able to be changed. For example, the father and the child are subsumed under the producer and the produced, and these, in turn, are put under the maker of change and what is changed (*Phys*. II.3, 194b29–32). This applies also to those situations in which the exercise of a skill or art, that is, an action in accordance with a form, is the source of change (*Meta*. Lambda 4, 1070b27–34). "It is common, then, to all sources to be the start from

which a thing either is or comes to be or is known: but of these some are present inherently in the thing and others are outside of it" (*Meta*. V.1, 1013a18–21). Thus, external causes and inherent causes both function as sources of change. In the medieval tradition and beyond, the focus is as much on the copresence of causes with their effects as it is on identifying the first source of change. Descartes's thought represents a special case of this conjunction, especially in regard to his conception of God as the first and principal cause.

In the Latin tradition, Aristotle's notion of "whence [arises] the first source of change or rest" is called the *causa efficiente* or *causa efficiens* from the verb *efficio*, "to make," "to do," or "to effect." It is well to note that Aristotle foregrounds the active cause in *Generation and Corruption* just so far as it acts in conjunction with the formal and final causes. For him, the acting cause by itself is merely "instrumental," in that it lacks the intelligibility that only a formal and final cause can confer on a change or a coming to rest. For example, in the act of sculpting it's not the sculptor who is the ultimate moving cause, but the art the sculptor possesses that directs the work. This accords with Aristotle's strategy always to seek the primary cause of each thing's change (*Phys*. II.3, 195b22–23). In and of itself, a principal efficient cause, in virtue of what it is, accounts for something's coming to be. Of course, the efficient cause, as the first source of change, differs from instrumental causes. The latter needs the cooperation of principal causes in order to act. As we'll see, Suárez and Descartes modify key elements of this picture by privileging the efficient cause as the cause that alone truly acts and therefore truly causes. Accordingly, Suárez and Descartes elevate the efficient cause to new heights. For them, it is the genuine cause, in that it alone is able to bring something into existence distinct and separate from itself.

But acting causes are foregrounded by Aristotle in another way that chimes with Suárez's and Descartes's aim of privileging the efficient cause. He recognizes that change must be initiated by an active thing (*to energoun*) that is first in activity (*Meta*. Theta 8, 1049b17–29). In Aristotle's hierarchic scheme, active things stretch from the lowly moved movers in the sublunary sphere, up to the higher unmoved movers (the planets), and eventually to the first unmoved mover, the ultimate source of all change. (This hierarchical picture, in which higher movers subordinate lower movers, is set forth notably in *Generation and Corruption* I.7, 324a2–324b4 and *Phys*. VIII.5 and 6.) Unlike unmoved movers, moved movers are changed in the act by which they move something. But an unmoved mover remains unchanged in acting on a lower mover, since its ontic status is higher in kind, and it does not change place with respect to a center. For mainly theistic reasons, the Christian and Islamic traditions develop this scheme. It offers a useful model for divine causation, since the changes

affected by the higher mover are not in it but in what it changes. By the end of the fifteenth and sixteenth centuries, the scheme is elaborated by philosophers such as Fonseca and Suárez (Menn 2000, 122–33). Thus, Suárez argues that lower efficient causes are subordinated essentially to God, and that there are hierarchies of "*per se* subordination among secondary causes themselves" (DM 22.5.1–20, 1:838–43. See also DM 17.2.7–19, 1:585–91). Descartes decisively rejects hierarchically embedded causes arranged in levels of subordination, and develops an account of the natural world devoid of substantial forms, causal levels, and autonomous agents of change.

There are other sources in the ancient world for the notion of the active cause. The Stoic Chrysippus (280–207), through the voice of Cicero, tells us that once a cylinder rolls, and the top spins, their motion is caused entirely by an internal cause: "it is by its own nature (*suapte natura*) . . . that the cylinder rolls and the spin-top turns" (Cicero 1965, *De Fato* 42). The cause in question is internal and perfect and principal (*perfectae et principales*) as opposed to auxiliary and proximate (a*diuvantes et proximae*) (ibid. 41). Both types of causes are active. But a perfect and principal cause acts independently and is called *aitios autoteles* by Clement of Alexandria (1992, 600), literally the "self-sufficient cause," which itself produces its own end. In general the Stoics hold (1) that a cause, strictly speaking, is what does something, or produces something; and (2) that true *causal acts* are restricted to the doings of things (Frede 1987, 128–42; McGuire 1994, 323–24).

Similar views are found in the Hellenistic tradition, as well as the claim that matter and form, far from being strict causes in their own right, are causal auxiliaries or subordinate causes (Frede 1987, 140). Aristotelian commentators, such as Simplicius, the sixth-century Neoplatonist, also stress that what acts is most strictly the cause. Simplicius calls Aristotle's primary "source of change" the "productive cause" (*poiētikon aition*) from the term *poiein*, to make or produce. (See Aristotle, *Meta.* Delta 2, 1013a19–32: *to poioun tou poioumenon*—"what produces is for what is produced.") For Simplicius, in his commentary on *Physics* 2, the productive cause is an agent cause, because having acted, it is "separate and distinct from its product." The formal cause can't satisfy this criterion, since it is "contained in the product" and thus "not the foremost among the producers." Accordingly, "the true agent (*poiētikos*) . . . must be distinguished from the product" in the sense that it is not constitutive of what comes to be (Simplicius 1997, 72, 79). Simplicius's emphasis on the separation of that which acts, the "strict" cause, from its effect, is not surprising, since the criterion is implied by Aristotle in *Metaphysics Lambda*: "Moving causes are causes in reference to what has [already] come to be, whereas formal causes are simultaneous [with what they

cause]" (Lambda 3, 1070a21–22). In the second century, Alexander of Aphrodisias, on Simplicius's report, had previously made the same point (Simplicius 1997, 75, 79). This background is important, since Suárez, and Descartes, will elevate the "separation" of God from his creation into a basic criterion of what counts as a principal efficient cause. Simplicius also expands Aristotle's four causes into a list of six by including the two "Platonic" causes. He adds the instrumental cause (*organikon*) and the paradigmatic cause (*paradeigmatikos*), both found in the *Timaeus*. So too does his contemporary, Philoponus, in the sixth century, in his commentary on Aristotle's *Physics* 2 (Simplicius 1997, 54, 74; Philoponus 1993, 54).

Although the Greek, Islamic, and medieval traditions generate countless accounts of Aristotle's quadruple causes, Avicenna's interpretation of the efficient cause has decisive historical import for the Christian tradition. This is especially so in regard to the way in which Avicenna conceives divine causation (Dunphy 1966, 4–8; Gilson 1986, 173–74; Olivo 1997b, 93; Carraud 2002, 72–75). The issue is this. For Christian thinkers, in order to appropriate Aristotle's causal views, the moving cause (*causa activa*), for example, the cause of generation, had to be transformed into an absolute creative cause of everything that comes to exist de novo. In other words, the theology of divine transcendence, and the conception of God as a being who creates the world unconditionally, demanded a new conception of efficient causation. The conception of God as the transcendent creator entails that there can't be a univocal conception of causation that applies both to God and to created things. In short, a conception of a creative and efficient cause that operates absolutely and unconditionally had to be established. So beyond the notion of an active cause that is the source of change and generation in created things, it was necessary to articulate a cause that is the ultimate source of anything whatsoever that exists.

In his pioneering work Dunphy (and following him Gilson) points to the late-thirteenth-century master Peter of Auvergne as an important agent of this transformation. In his *Quaestiones in Metaphysicam*, Peter credits Avicenna as the source for the distinction between that which gives being to something apart from itself through motion (*unde principium motus*, i.e. "whence the source of change"), and a conception of a source of change that imparts substantial being to another by an absolute and immediate creative act (Dunphy 1966, 4–7; Gilson 1986, 176).

From a Neoplatonic perspective, according to Peter, Avicenna asks how God's agency can be understood in terms of Aristotle's views on causation, a problem at the heart of the Hellenization of both the Islamic and the Christian worldviews. Avicenna states: "By agency (*per agentem*), the Divine philosophers [the theologians] do not understand only the cause

of motion (*principium motionis*), which is the basis of natural philosophy, but the cause of being (*principium essendi*) and its giver (*datorem eius*), which is the creator of the world" (Dunphy 1966, 5). Avicenna subsumes both the cause of motion and the cause of being under the term *causa agens*. But the latter notion, the *principium essendi*, is for him the paradigm conception of agent causality; this, he argues, satisfies the general notion of the efficient cause, namely, that by which an effect acquires a being other than its cause.

Important here is Avicenna's emphasis on what makes the agent cause what it is: it is a principal cause just because, in virtue of its *act of causing*, it alone imparts existence to an effect that is distinct from itself. The *principium motionis* acts to this end by means of motion alone. But the second type of efficient cause, the *principium essendi*, is the unconditioned source of the existence of things (*unde principium esse*): as such it is distinct from Aristotle's moving cause (Dunphy 1966, 5; Gilson 1986, 175–76; Olivo 1997b, 91; Carraud 2002, 73–75). The *principium essendi*, as it becomes instantiated in the theological tradition, is the belief that substances created by divine power are truly new because they are created absolutely without any process of becoming or development. This contrasts with the Aristotelian notion that what is new comes to be by movement in a subject, for example, by the actualization of an ability already possessed by some existing thing. This notion refers to processes in which something is altered or departs from its former condition by an act of movement. If the effect is a new substance, then the patient is the matter out of which that substance is generated; if the effect is an accident, then the patient is the subject of that accident. Within this framework, Avicenna subsumes Aristotle's efficient cause under the label *principium essendi*, and applies it specifically to divine causation. However, he still understands agent causation as both a cause of moving (*causa motrice*), so far as it is acting, and a cause of being, so far as it imparts being (Dunphy 1966, 10; Gilson 1986, 175; Carraud 2002, 73).

Peter of Auvergne clarifies the distinction between the moving cause and the efficient cause. Unlike Avicenna, he does not posit a separate cause, the *principium essendi*, as an efficient cause different in kind from the traditional moving cause. Rather, under the common term *efficiente* he includes both the origin of movement (*unde principium motionis*) and the origin of being (*unde principium esse*). For him, the *primum efficiens*, movement, and the *secundum efficiens*, being, are two instantiations of the same species of cause, that is, the efficient (Gilson 1986, 175). Peter's strategy unifies Avicenna's equivocal "twofold" active cause under the term "efficient," which now signifies any change whatsoever brought about by an active cause. In short, the principle of movement (*principium motionis*) is a cause of being just in case a change is affected in some

antecedently existing subject that alters how it exists. So understood, it can be subsumed, as a special case, under the general category "cause of being," that is, *unde principium esse*.

The interchangeable use of the terms *causa agens*, *causa activa*, *causa movens*, and *causa efficiens*, evident in Thomas Aquinas (c. 1225–74), continues into the fourteenth century (Gilson 1986, 14). However, Avicenna's *causa agens* is replaced by *causa efficiens*, so that *causa esse*, understood in Peter's broad sense, emerges as the basic sense of efficient causation and is attached in the first instance to God as the primary agent of change (Gilson 1986, 175). In fact, in the fourteenth century a principal efficient cause (one whose action follows from its own nature) is understood as (1) that at whose existence another follows, and (2) that which gives being to something separate from itself (Adams 2007).

These salient features of the causal tradition find their way into Francesco Suárez's influential *Metaphysical Disputations* (1597). More than a commentary on Aristotle and Scholasticism, Suárez's treatise is highly innovative, and it is a major conduit through which the causal tradition flows into the thought of the seventeenth century. In the first instance, Descartes would be abreast of the broad outline of this tradition through the Coimbra commentaries he read at La Fléche. Moreover, we know that the texts of Suárez were taught at La Fléche (Des Chene 1996, 10), but to what extent Descartes was familiar with him is difficult to determine. He refers to him once in the *Fourth Reply*, but cites the wrong *Disputation* (AT 7:235; CSM 2:164). Furthermore, Descartes's use of causal reasoning in *Meditations* III and V bears traces of Suárez's extensive discussion. In what follows we suggest that it's reasonable to suppose Descartes knew Suárez's discussion of efficient causality. For example, Suárez draws an important distinction, in the manner of Peter of Auvergne, between *causa secundum esse* (cause of being) and *causa secundum fieri* (cause of becoming or of "making" something), a distinction employed by Descartes in the *Fifth Reply* (AT 7:370; CSM 2:255, and Suárez DM 21.1.8, 1:787–88). Suárez's discussion provides a detailed context for understanding how these terms were used, and provides background that illuminates Descartes's use of them.

Suárez begins by saying, "An effect is said to be from the cause with respect to its coming to be (*in fieri*) when it does not absolutely and unconditionally (*simplicitur*) require that cause in order to exist, but instead requires it only in order to exist through the action or production (*effectionem*) [in question]. By contrast, an effect is said to be from a cause directly with respect to its *esse* (*secundum esse*) when absolutely and unconditionally it requires that cause in order to exist." In other words, if the effect receives from an agent "a form and being (*esse*) of the same type as the form and the being that exists in the cause, then the effect comes from,

and depends on, that cause just with respect to its coming to be [or being made] (*secundum fieri*), but not with respect to its being (*secundum suum esse*)." The point Suárez makes is exemplified by the acorn, which, already in existence, contains the form that will produce the oak tree *secundum fieri*. In contrast to this type of causal action, Suárez concludes that "only that agent which is of a superior account, as opposed to one that is of the same account [as the effect it produces], and which does not communicate its own form or nature to the effect . . . can be the cause of the effect, not only *secundum fieri*, but also *secundum esse*" (DM 21.1.8, 1:787). Thus God is the cause of the sheer fact that anything exists and continues to exist. Suárez explains:

> Only the first cause is essential being itself: every other being is participation in its being, and therefore by intrinsic necessity it requires the *influxus* (action) of what has being essentially in order to exist (*ut sit*), which argument not only seems to prove that God is the cause of his effects *secundum esse* directly, but also that God alone is the cause of other [created] beings in this way (*hoc modo*), because no being (*nullum ens*) comes from a created cause in such a way that it absolutely and simply needs [only] that cause in order to receive being (*esse*); indeed, it is possible to exist by divine *influxus* alone without any other cause, but the contrary is not possible. (DM 21.1.8, 1:788)

Suárez goes on to argue that if an effect proceeds from a cause it requires unconditionally and necessarily, "then it depends on that cause's actual creative action (*ex actuali influxus ejus*), not only in order to receive *esse* (being) initially but also in order to endure and persist in that being—which is what it is to depend on it for its conservation" (ibid.). Thus, in virtue of God's efficient and total causality, substantial being is produced de novo, but all other causes are subordinated to God's causal act since they depend entirely on God's creation and conservation for their substantial being. As we'll see, Suárez's discussion provides an informed context from which Descartes may have appropriated the *causa secundum esse* and *causa secundum fieri* distinction.

God's Efficient Causation and the Introduction of *Causa Secundum Esse*

Descartes's conception of God's efficient causation is fundamental to his thought. From the early letters to Marin Mersenne in 1630 to the *Meditations* and *Replies* (1641) and *Principles* (1644; French 1647), his emphasis on causality remains constant. However, during the period of his *Re-*

plies to Objections to the *Meditations*, Descartes rereads some classic works, which lead him to reconsider causation in a more nuanced and deeper way. Specifically, during the early 1640s he begins to think in terms of the Suárezian distinction between *causa secundum esse* and *causa secundum fieri*.

Descartes's general views on causation, from 1630 onward, are linked with three concepts essential to his understanding of divine essence, namely, that God is "infinite" and "beyond our grasp" and is a being of "incomprehensible power." This view of divine essence is abundantly evident in the *Meditations* and *Replies* (1641) and the *Principles* (1644) (AT 7:110; AT 8.1:14; CSM 2:79; CSM 1:201), and we consider it in detail in the first section of the next chapter, where Descartes's identification of divine power and essence is explored in connection with his view of God as *causa sui*. In the present section, Descartes's conception of divine efficient causation is considered, and we chart its changing representation in his developing thought. To conceive the creative act in causal terms is, for Descartes, to think that God's power is exercised through the action of a principal efficient cause. In this way, we are able to represent, through his created effects, God's relationship to the world, despite our inability to embrace God's "incomprehensible power."

The continuity of Descartes's causal views can be made evident by briefly looking at what he writes, at different times, about the nature of God's causality. As we progress through the texts, we discuss the changes that occur regarding Descartes's understanding of the nature of causality. On May 27, 1630, Descartes writes in French to Mersenne with technical terms in Latin: "You ask me by what kind of causality (*in quo genere causae*) God established (*disponsuit*) the eternal truths. I reply: by the same kind of causality as he created all things (*il a creé toutes choses*), that is to say, as their efficient and total cause (*ut efficiens & totalis causa*). For it is certain that he is no less the author of creatures' essence than he is of their existence; and this essence is nothing other than the eternal truths" (AT 1:151; CSMK 25). Proclaiming God to be the cause of creation is a religious commonplace, but proclaiming God to be the *total and efficient* cause of all the things that are, including eternal truths, is not commonplace. Moreover, for Descartes, God's efficient causation of eternal truths is tied to a very strict notion of divine simplicity in which understanding and creating and willing constitute an indivisible and unitary creative act (to Mersenne 1630; AT 1 153–54; CSMK 25–26). These commitments indicate that Descartes's view of divine causation differs in important ways from the concept he inherits.

The terms "efficient" and "total" occur throughout Descartes's later writings. As earlier, the context is one in which he articulates his conception of the primary cause or source of change. In *Meditation* III (1641),

at the start of his two-part "proof" of God's existence, Descartes says: "Now it is manifest by the natural light that there must be at least as much in the efficient and total cause (*in causa efficiente & totali*) as in the effect of that cause. For where, I ask you, could the effect get its reality from, if not from the cause? And how could the cause give it to the effect unless it possessed it? It follows from this both that something cannot arise from nothing, and also what is more perfect—that is, contains in itself more reality—cannot arise from what is less perfect" (AT 7:40–41; CSM 2:28). In the *Principles* (1644) we find a similar formulation: "For it is very evident by the natural light not only that nothing comes from nothing but also that what is more perfect cannot be produced by (*produci*)—that is, cannot have as its efficient and total cause (*ut a causa efficienti & totalis*)—what is less perfect" (I.18; AT 8.1:11–12; CSM 1:199). Indeed, the infinitude of divine power is such that God "not only knew from eternity whatever is or can be, but also willed it and preordained it" (I.41; AT 8.1:20; CSM 1:19).

To emphasize Descartes's views on the extent and scope of God's power, we need an excursus on the nature of freely created eternal truths. In a letter to Mersenne (1630), Descartes stresses that God's causal power ranges over essences, natures, and eternal truths, as well as over created things that is, "real entities." He writes: "The mathematical truths which you call eternal have been established (*etablies*) by God and depend on him entirely no less than the rest of his creatures. . . . Please do not hesitate to assert and proclaim everywhere that it is God who has laid down these laws in nature just as a king lays down laws in his kingdom. . . . They [the eternal truths] are 'inborn in our minds' (*mentibus nostris ingenitae*) just as a king would imprint his laws on the heart of his subjects if he had enough power to do so" (April 15, 1630; AT 1:145; CSMK 23). On May 27, 1630, he replies to Mersenne:

> You ask also what necessitated God to create these truths; and I reply that He was free to make it not true that all the radii of a circle are equal—just as free as he was not to create the world. And it is certain that these truths are no more necessarily attached to his essence than are other created things. (AT 1:152; CSMK 25)

Although the exchange occurs much later, he makes similar points to Pierre Gassendi in 1641: "so I do not think that the essences of things, and the mathematical truths which we know concerning them, are independent of God. Nevertheless, I do think that they are immutable and eternal, since the will and decree of God willed and decreed that they should be so" (AT 7:380; CSM 2:261). For Descartes there is no created thing that does not depend on God, who is the unconditioned cause of its existence. In a letter to Denis Mesland of May 2, 1644, he expresses the

same sentiment. He notes that God's freedom is not compromised in creating eternal truths: "even if God has willed that some truths should be necessary, this does not mean that he willed them necessarily; for it is one thing to will that they be necessary, and quite another to will this necessarily, or to be necessitated to will it" (AT 4:119; CSMK 235). Yet it is important to note that Descartes's talk about God's free will does not preclude his describing how God relates to created essences. Because, as he says early on, and continues to say throughout his life: "In God willing, understanding, and creating are all the same without one being prior to the other even in reason (*ne quidem ratione*)" (letter to Mersenne, May 27, 1630; AT 1:53–54; CSMK 25–26). This, as we've indicated, is a very strict conception of the indivisible unity of divine nature.

Descartes's claim that God is the efficient cause of eternal truths or essences is astonishing and without a clear precedent in the history of philosophy. The claim is not found in Suárez, who thinks that the *aeternae veritates* reflect God's nature and therefore are not dependent upon an arbitrary act of divine will (DM 30.9.1–61, 2:116–36). He vigorously attacks the view, which he traces to Henry of Ghent, that essences enjoy an *esse essentiae*, a mode of being that is eternal, uncreated, and prior to God's efficient causality (DM 31.2.2, 2:229–30). According to Suárez, God neither creates from eternity, nor in a necessitated fashion: he creates freely and in time (DM 31.2.3, 2:230). In Suárez's view, there is nothing produced by an efficient cause that lacks real existence, and what exists actually must be separate from the cause that produces it. Thus, to claim, as does Descartes, that essences are products of an efficient causal act would mean that they have the mode of being of a real entity. But for Suárez, the essences of creatures, prior to their creation, are absolutely nothing (DM 31.2.4–5, 2:230). Suárez's use, in this context, of the expressions *omnino nihil* and *non ens* to characterize essences should not be misconstrued. He conceives them as possibilities in God's mind, as truths known to God, which lack any form of real existence (Doyle 1967, 29–48). It is in this sense that Suárez calls an essence that exists prior to creation a "no-thing," that is, literally a nonentity. Moreover, although for him essences have *esse objectivum* in God's mind, this he understands as an extrinsic denomination with respect to God's omnipotence, and not a positive if diminished mode of being in God (DM 25.1.6–7, 1:901; DM 31.2.8–9, 2:231–32; see Wells 1981, 73–85). In short, though it is true to say that man is rational, and that this is known to God, it would not be true in fact if God had chosen never to create a man. In this sense essences and eternal truths do have connections with divine will. But Suárez's conception falls short of Descartes's claim that God creates eternal truths, *per se*, by a free act of efficient causation just as he efficiently creates everything else. Descartes's claim is an illustration of his uncom-

promising voluntarism and of the extreme manner in which he interprets divine omnipotence.[1]

Let us return now to Descartes's core conception of efficient causation as it emerges in the 1640s. In his *Fifth Reply* (1641) to Gassendi, Descartes distinguishes between "causes of coming into being (*secundum fieri*)"and "causes of being (*secundum esse*)" (AT 7:369; CSM 2:254). In terms of this distinction, God is the efficient cause, *secundum esse*, of all things that exist, and thereby of the capacities they possess to be causes *secundum fieri*. Conceiving God to be the cause *secundum esse* corresponds to Avicenna's and Peter of Auvergne's conception of divine causality as the *principium essendi*. For Descartes, this means that God's efficient causation is the absolute ground that any thing that exists requires, such that God "must always act (*influit*) on the effect in the same way in order to keep it in existence (*conservet*)" (*Fifth Reply*; AT 7:370; CSM 2:255).

We need to note, however, that Descartes's use of the *causa secundum esse* notion differs from traditional views. In medieval theology, God need not conserve things directly—the view to which Descartes is firmly committed—since he can conserve them through mediating causes. Certainly, for medieval thinkers, everything is created immediately, but existing things are ordered such that certain of them depend on others, and consequently their existence is conserved secondarily in conjunction with divine power. For Descartes, as noted, mediating causes, or orders of causal subordination, are unnecessary. By the time of the *Meditations*, he holds that mediating causes detract from God's power, raise problems of infinite regression, and obscure the fact that God immediately conserves the state of all existing things. Indeed, in the *First Reply*, Descartes explicitly banishes hierarchically ordered causes from his ontology of creation (AT 7:106–7; CSM 2:77).

In his *Fifth Reply*, Descartes cites Aquinas's *Summa Theologiae* as a source for the cause *secundum esse* and the cause *secundum fieri*. This does not mean, of course, that Descartes's knowledge of the distinction comes solely from Aquinas, nor that the possibility must be rejected that he consulted Suárez's more nuanced and fuller account. In the course of his lengthy discussion, Suárez illustrates the distinction between *secundum esse* and *secundum fieri* (as does Aquinas, whom he cites) by analogizing God's creative action to the sun's action in causing light (Aquinas 1964, 1a, q. 104, art. 1, ad 4; see Garber 1992, 265–66). The sun is the efficient cause of light *secundum esse*, since the sun is more perfect than the dependent light, not only for the light's coming to be, but for its continuing to exist. Moreover, the sun's light illuminates whatever it does

[1] We are grateful to Professors Freddoso and Doyle for discussion on Suárez's position.

directly and instantaneously. Should its action be eclipsed, all light would cease. Similarly, should God withhold creative power, creation would cease to exist. In his *Fifth Reply* Descartes also employs the idea that the sun and God are direct causes of being: "The sun is the cause of the light which it emits, and God is the cause of created things, not just in the sense that they are the causes of coming into being of these things, but also in the sense that they are causes of their being" (AT 7:369; CSM 2:264–65). He repeats the sun analogy when writing to Hyperaspistes (1641): "it is more certain that nothing can exist without the cooperation of God than that there is no sunlight without the sun" (AT 3:423; CSMK 189).

Notice that Descartes's *Fifth Reply* and his letter to Hyperaspistes are both composed in 1641. In this connection, two letters are worth noting. On September 30, 1640, he asks Mersenne to send him some of the philosophical textbooks of the Jesuits from whom he expects to receive objections to the *Meditations*. Again in November 1640 he says that he is considering printing Eustachius a Santo Paulo's *Summa philosophica quadripartite* (1609) with comments drawn from the "principles of my philosophy" (AT 3:259; CSMK 161). This indicates (among other things) that from 1640 to 1641, Descartes was thinking hard about the implications of his philosophy and, in reaction to criticism, engaged himself with current philosophical literature. We can conjecture, therefore, that his use of the distinction between cause of being and cause of becoming indicates a deepening awareness of his causal commitments, and perhaps his first full recognition, through Aquinas and possibly Suárez, of the sort of metaphysical reasoning lying behind the conception of "twofold" efficient causation put forward by Peter of Auvergne.

It is clear how the concept of God's efficient causation functions in Descartes's thinking; but how does Descartes conceive the metaphysics of the efficient cause? Suárez's critical interpretation of Aristotle will be helpful in this regard. Suárez's aim is to clarify, and give an account of, what is common to all kinds of efficient causation. For him Aristotle's definition is too narrow and applies only to natural causes that act through motion or change. Second, he notes that Aristotle's conception of the efficient cause, namely, whence arises the first source of change and rest, is ambiguous, since it fails to specify the genus to which efficient causation belongs. Suárez argues, accordingly, that two criteria must be satisfied: (1) the term "*per se* principle" must be supplied, so that the efficient cause can be understood to be "the *per se* principle from which a change first exists or comes to exist," and (2) the principle must be understood as a "*per se extrinsic* principle from which a change first exists" (DM 17.1.1, 1:580–81). These criteria emphasize that an efficient cause brings about an effect that is wholly separate from itself. These criteria in place, Suárez sets forth his general conception of efficient causation: "To say that an efficient

cause is the first principle whence (*unde*) an action exists is the same as saying that it is that whence the effect exists by the mediation of an action; that is, the same as saying that it is a principle from which the effect flows forth (*a quo effectus profluit*), or on which it depends, through an action (*per actionem*)" (DM 17.1.6, 1:582).

In addition to the separation of cause and effect, Suárez also stresses "action" and "agency" to make clear the nature of the causality involved in every act of efficient causation, including that of divine creation. He argues that if Aristotle's phrase "change or rest" is replaced by "the word 'action,' the definition will encompass every efficient cause, even the first efficient cause insofar as he creates. For, as we will see below, creation, too, is an action, even though it is not a change" (DM 17.1.4, 1:581). Thus, replacing "change" by "action" accommodates the notion of creation ex nihilo: (*a*) because the creative act doesn't presuppose the antecedent existence of something acted upon and hence changed, and (*b*) it satisfies the requirement that the action of a primary creative cause occurs in what is created and not in the creative cause itself. In other words, the action of God's creative activity in no way diminishes or changes God.

For Suárez, to speak of the "efficient cause" is to refer to the act of causing, namely, to the cause *in action*. Thus, a cause is an efficient cause insofar as it is *in act*. "It is not the material cause that gives being (*non dat esse*), but the formal, and among the extrinsic causes, it is not the final that gives being, but the efficient (*sed efficiens*)" (DM 12.2.4, 1:384). Suárez's emphasis differs from Aristotle's since, for Suárez, the weight is on the causal action of the efficient cause, and not on the causality of the formal, material, and final causes. As we'll see in the next section, in accordance with this understanding of causal action, the strict copresence of cause and effect is central to Descartes's conception of causation. Indeed, in the *Fourth Reply* he says that the meaning of "efficient" cause is not restricted to causes that are prior in time, stating that this "is clear from the fact that the notion of a cause is applicable only during the time when it is producing its effect" (AT 7:140; CSM 2:167).

The active nature of causation is stressed in Descartes's conception of God's vertical causation. Like Suárez and the late Scholastics, Descartes uses the term *influxus* to describe the action of an efficient cause. For example, in the *Fourth Reply* (1641) he tells Arnauld that "God is not self-created or self-preserved by any positive action of an efficient cause (*causae efficientis influxum*)" (AT 7:232; CSM 2:162). Gassendi is told in the *Fifth Reply* (1641) that for something to be conserved in existence we "need the continual action of the primary cause (*nos continuo causae primas influxu indigere*)" (ibid. 369 and 254). Strictly speaking, *influxus* means "to flow forth or into," but, by the time of Suárez and Descartes, the term had been stripped of its emanationist connotations, and is used

to refer to the *action* of an efficient cause. To be specific, the use of *influxus* (and cognates such as *emanatio*) in referring to God's efficient causation doesn't imply the literal transference of anything from God to that which comes into being de novo (Carraud 2002, 131; Freddoso 2002, xlvii–xlviii). We need to look at this, since it's essential for understanding the causality involved in Descartes's conception of God's efficient causation.

A consideration of *influxus* in nonemanationist terms is necessary since Christian creation is rooted in Aristotle's account of agency. In *Physics* III.3 Aristotle argues that change is in the moved, not in the mover. Similarly, in *Physics* VIII.6 and *Metaphysics* Lambda, he describes explicitly an ontology of *absolutely* unmoved movers that in acting are unmoved in any respect whatsoever. They are *per se* agents of change that have a higher ontic status than that which they change, are the starting point of the action, and are not reciprocally affected despite their action. What's essential to this picture is that the change is in what comes to be and not in the agent that does the changing. Accordingly, the changed properties constituting the effect, or *terminus ad quem* of the action, determine the effect's nature and identity. This in no way impugns the fact that the effect depends causally on the agent at the *very time* that it is causing it.

This ontology of action applies to change brought about in antecedently existing things, and, as we'll see, it also covers creation ex nihilo. Consider now the case of natural change in created things, which is less complicated than creation ex nihilo. The Scholastic position is that the agent's action doesn't consist in the transfer of its individual form to the patient as if the form could "jump" from one to the other. In other words, although the Scholastics speak of causal transmission, for them this doesn't involve the transfer of numerically the same form or reality from the agent to the patient. For example, in his *Summa Contra Gentiles* Aquinas says that "a natural agent does not transfer its own form into another subject, but instead reduces the subject that is acted on from potency to act" (1934, book 3, chap. 69, p. 305). This means that a heating body produces heat "not in the sense that numerically the same heat that exists in the heating body passes over into the heated body, but rather because by virtue of the heat that exists in the heating body a numerically distinct heat comes to exist in actuality in the heated body" (ibid.). But if the transeunt action of the heating body does not involve a transference of its form, in what does it consist? According to this causal model, the agency of the heat terminates in the effect, that is, in the "reduction" to actuality of the heated body's potentiality to be heated. So the heat, in some sense, has to preexist in the body that becomes heated. Here, as Suárez puts it, the action can be understood as a medium or "path" directing the agent toward its destination (DM 17 1.6, 1:582). But what is acted upon, as a result of the causal action, actualizes a potential to be the

appropriate effect of the action. Thus, in a sense, the cause does not "give" anything, since it doesn't transfer its own form or being to the effect.

For relations among creatures at the "horizontal level," Descartes rejects the ontology that this view of efficient causality presupposes. It posits substantial forms in things that underwrite the potential of what they can become and the unifying ground of what they are (AT 3:503–4; CSMK 207–8). The language of "potentiality" and "actuality," and the metaphysics of final causes in which Suárez couches his position on efficient causation, also carry commitments Descartes cannot accept (AT 11:39; CSM 1:93–94). Nevertheless, he agrees with Suárez that a horizontal cause does not transfer anything from itself to its effect. That is to say, in cases of formal containment, although the cause contains something similar to the effect, it nevertheless does not impart the very same thing it formally contains to its effect. For example, in *Meditation* III Descartes says that an external cause of an idea "does not transfer any of its actual or formal reality" (AT 7:41; CSM 2:28). Later in a letter to Henry More of August 1649, he states explicitly that in body-body causation "motion, being a mode of body, cannot pass from one body to another" (AT 5:404; CSMK 382). These statements imply that a body causes another's motion if the latter exhibits motion similar to, but numerically distinct from, the motion of the causing body. This fits the notion, discussed above, that the efficient cause is the *principium motionis* whose causality is "extrinsic" to its effect, since the being of the effect is distinct from that of the cause. In other words, cause and effect must share something in common (the genus motion, in this case), but they must be dissimilar in being if they are not to be identical. We return to Descartes's conception of "horizontal causation" in the section entitled "Causal Axioms and Common Notions" of the present chapter. Causation among material bodies will be considered in chapter 4 and the causation of sensation in chapter 6.

In regard to his causal conception of God's creative act, Descartes, it seems, is squarely rooted in the tradition found in Avicenna and Peter of Auvergne and discussed by Suárez. We've seen that for Avicenna and Peter of Auvergne, God's original creative act is the *principium essendi* or the cause *secundum esse*. In theological language, this says that what is created ex nihilo comes into existence de novo. What is created must be completely new since there is nothing besides God that exists. That is, before creation there is nothing antecedently in existence that can be changed by a cause, nor is there any substantial form that can be taken to actuality. In short, God's creative act brings about being or *esse* in things as they are. Furthermore, there is no literal transference of reality or essence from God to creation, and God is not diminished in being or power in virtue of the act of causing. This tradition of reasoning, represented by Suárez, lies behind Descartes's claim that God simply creates

instantaneously, since "the universe . . . is an entity created by a single act of the divine mind" (AT 7:135; CSM 2:97). The belief that there is no literal transference involved in God's act of vertical causation is considered in the second section of chapter 3. It demands a careful discussion of the "eminent containment" doctrine and the causal likeness principle.

A remarkable passage in Descartes's *Sixth Reply* (1641) throws interesting light on his conception of "efficient" causation:

> If anyone attends to the immeasurable greatness of God he will find it manifestly clear that there can be nothing whatsoever which does not depend on him. This applies not just to everything that subsists, but to all order, every law, and every reason for anything's being true and good. . . .There is no reason to ask what category of causality is applicable to the dependence of this goodness upon God [i.e., Descartes refers to his belief that things are good and true because God makes them so], or to the dependence on him of other truths, both mathematical and metaphysical. For since the various kinds of cause were enumerated by thinkers who did not, perhaps, attend to this type of causing, it is hardly surprising that they gave no name to it. But in fact they did give it a name, for it could be called efficient causality (*efficiens*), for the same reason that a king is the one who is the "effector" (*effector*) of a law, although the law itself is not a thing which has physical existence, but is merely what they call a "moral being" (*ens morale*). . . . there cannot be any kind of entity that does not depend on God. . . . Hence we should not suppose that eternal truths "depend on the human intellect or on other existing things"; they depend on God alone, who, as the supreme legislator, has ordained them from all eternity. (AT 7:436; CSM 2:294)

Notice Descartes's remark that the causality he attributes to God has no name in traditional causal discourse. He adds, parenthetically, as he did to Mersenne in 1630, that divine causation may be called "efficient" on analogy to the manner in which a king lays down the law to his subjects. For Descartes willing, creating, and understanding are the same act in divine nature, so his appeal to the analogy of the king is not surprising. Just as the king freely ordains the laws in his kingdom, God unconditionally lays down the constitution to the world. Consequently, the ultimate connection between cause and effect is entirely established by the agency of divine will. What exists is what it is because God ordains it (i.e., understands-wills-creates it) to be thus and so. Accordingly, the analogy also implies that the creative act is not a transeunt act of causal transference from God as cause to the world as effect. This is so because there is no world before God creates it, just as there is no law before the king pro-

claims it. We'll continue this discussion in the first section in chapter 3, where we discuss the development of Descartes's causal commitments in the *Second* and *Fourth Replies* (1641). It is also worth noting Descartes's claim that the king's laws do not exist as physical things, but do so with the status accorded to a moral being. In the light of Descartes's analogy to God, it would seem that the laws of nature now have a similar status. In other words, Descartes is claiming that they exist only as determinations of divine acts. Given the analogy to God, this signifies a change from the status the laws have in *The World*, where they are conceived to be part of the structure of things, to the status of rules that we must use in order to guide the process of knowledge acquisition. The significance of this shift will be considered in chapter 4, where we discuss the laws of nature in the *Principles*. It's important to note that viewing laws to be akin to what has "moral being" does not appear in the 1630 letters to Mersenne. The emphasis of Descartes's account of eternal truths will change by 1644 with the publication of the *Principles*. In this mature work he says that eternal truths "have no existence outside our thought" (AT 8A.23; CSM 1:208). In his account, eternal truth is not linked to essences as previously, and there is no reference to "true and immutable natures" that impose themselves on our minds. We discuss this important shift in chapters 5 and 6. It is connected with Descartes's late position on the cognitive boundaries of human cognition, and with the need to give an account of how universal ideas are learned in the light of reflective experience.

For Descartes, God is not only the efficient cause but also the *total* cause. These terms, taken together, state that God is necessary and sufficient for causing unconditionally the existence of created things. Conjoining the terms "efficient" and "total" is central to Descartes's thinking about God. This is evident in a letter to Mersenne (1640) in which he indicates changes to be made in the manuscript of the *Meditations* and the *Replies*. In response to Mersenne's query about *Meditation* III he replies: "It is certain that there is nothing in an effect which is not contained formally or eminently in its EFFICIENT and TOTAL cause (*quod non contineatur, formaliter vel eminenter, in causa EFFICIENTE & TOTALIS*). I added these two words on purpose. The sun and the rain are not the total cause of the animals they generate" (December 31, 1640; AT 3:274; CSMK 166). In other words, the sun and the rain are partial causes of the total effect produced. Thus, Descartes makes it clear in this context that the phrase "efficient and total" is restricted to the primary and principal cause, and, for the first time, he links that phrase directly to the terms "formal" and "eminent". The implications of this linkage are clearly present, as we shall see, in the causal arguments of *Meditations* III and VI (AT 7:41–42, 79–80; CSM 2:28–29, 55). But it is striking to note that neither

the term "efficient cause" nor the phrase "efficient and total cause" appears in *The World* or the *Discourse on Method*. So perhaps this causal picture is not yet part of Descartes's developing thinking.

Another important feature of Descartes's conception of causation may well have roots in Suárez. Not only does Suárez give a general account of efficient causation, but he also holds that only the efficient cause is fully causal because it alone is truly active in the sense that, though it acts apart, it imparts being to what it affects. Suárez says that "the entire definition of cause [is that which] most properly suits the efficient [cause] (*tota definitio causae propriissime convenit efficienti*" (DM 12.3.3, 1:389). Given that the efficient cause acts apart from what it affects, Suárez articulates two conditions of what it means to be active in the manner of the efficient cause: "The cause is that on which something depends (*aliquid pendet*) *per se*": and "The cause is the principle *per se* that produces being (*influens esse*) in another thing" (ibid. 2, 7, 1: 385). The other causes do not satisfy together conditions 1 and 2. Thus, the act of efficient causing is a doing, which affects a "transference" from cause to effect, where the cause is really distinct from the effect, whereas an intrinsic cause, such as the formal, is a component of its effect, and as such puts something "into" the effect only *per analogiam*. All of this underscores the intuition that "active" and "passive" are terms that have clear purchase in efficient-causal relations. It is worth noting that Suárez puts stress on the interdependence of the terms *influere* and *dependere*. They refer to the same event from opposite sides of the causal relationship. The former signifies the active production of being or existence in something other; the latter signifies that the other's being results from the prior action of the cause. These definitions allow Suárez to say that "no thing is a being that is neither a cause nor an effect (*Nullum autem est ens quod non sit vel effectus, vel causa*)" (DM 12.prologue, 1:372–73; he makes the same point in DM 27.1.10, 1:952).

A closer look at Suárez's position on the interrelations of the causes highlights the claim that action is central. Given that the efficient cause is the extrinsic principle of action, Suárez argues that the other causes can be subordinated to it. For him, the causality of the material and formal causes can only express itself only through the extrinsic action of the efficient insofar as it imparts being. Suárez takes the core notion of efficient causality to be the communication of being (*esse*) to a subject by an agent through the mediation of an action: "For the matter and the form, speaking *per se*, do not cause by means of an action; instead, they cause by means of a formal and intrinsic union" (DM 17.1.6, 1:582). So strictly speaking, unless aided by the action of the efficient cause, neither the formal nor the material cause can make a contribution to a causal transaction, even though they affect a union. Consequently, if to cause is

to cause existence, the action of the efficient cause is presupposed by the causality of the material and formal causes (DM 27.1.10, 1:952; see Olivo 1997b, 97).

With this background in mind, we can now consider an important example of Descartes's conception of the efficient and total cause at work. In his *Fifth Objections* Pierre Gassendi criticizes Descartes's causal reasoning in *Meditation* III. He argues that the tag "'There is nothing in the effect which is not in the cause,' must be taken to refer to material rather than efficient causes. An efficient cause is something external to the effect, and often of a quite different nature. Although an effect gets its reality from its efficient cause, it doesn't follow that the efficient cause necessarily has this reality in itself; it may have borrowed it from elsewhere" (AT 7:288; CSM 2:201). Earlier he does cite Descartes's qualified version of the tag from *Meditation* III, namely, "it is manifest by the natural light that there must be at least as much [reality] in the *efficient and total* cause as there is in the effect of that cause" (AT 7:288; CSM 2:200; emphasis added). The unqualified version that Gassendi cites above manifestly fails to individuate the sort of cause that Descartes invokes. It implies that any type of efficient cause will do. Thus, to the extent that he bases his criticism on the unqualified version, Gassendi conspicuously misses the point of Descartes's use of the causal axiom in *Meditation* III, namely, as a necessary move for mobilizing an adequate conception of divine causality in order to prove God's existence. Specific to this conception is Descartes's view that God's inexhaustible power must be conceived in terms of the total, efficient, and primary cause of everything that exists. Thus, Descartes explicitly refers to a cause that is *the* "efficient and total cause." In this way, the infinitude of God's causal power is represented by invoking a cause that has greater perfection than the effects it produces.

Before looking at Descartes's response to Gassendi, which brings out another striking aspect of his conception of efficient cause, it will help to consider the Aristotelian-based causal examples that Gassendi uses in this exchange. The first example is "effects produced from some skill." The house comes to be from the action of the builder's efficient causation. But "the builder does not have this reality in himself—he simply takes it from some other source and passes it on to the house"(ibid. 289, 201). The second example is from the natural generation of things. Given Gassendi's materialist perspective, this means that the parent passes "some sort of matter on to his offspring" so that its characteristics derive "not from an efficient but from a material principle" (ibid.). Lastly, and not surprisingly, Gassendi views Descartes's statement that the effect is contained in the cause either formally or eminently as largely empty. For Gassendi the phrase claims no more than that the form of the effect is sometimes like that of its cause, while sometimes it is dissimilar. Thus, a cause doesn't

necessarily bestow anything of itself on its effect, or even necessarily share its form with the effect. True to his materialist principles, Gassendi concludes by saying that "an efficient cause does not contain its effect except in the sense that it may shape it and produce it out of a given material" (ibid.). Clearly the agenda of the two thinkers colors the way they understand and use the causes.

Descartes replies in terse and blunt terms to Gassendi's assertion that a material, rather than efficient, cause must be meant: "it is unintelligible that perfection of form should ever preexist in a material cause; it can do so only in an efficient cause" (AT 7:366; CSM 2:252). Certainly, Descartes's denial that form preexists in matter has the weight of the causal tradition on his side. But to claim that the form preexists "in an efficient cause" is far from traditional (as Arnauld makes clear in the *Fourth Objections*). On the face of it, Descartes seems to imply either that the formal cause exists in the efficient cause, or is, in some sense, reducible to it.

Descartes's statement that the form preexists in the efficient cause is very general in scope. As we have noted before, for Descartes God's willing, understanding, and creating are a single simple act in divine nature.[2] Thus, the reason and volition for creating are indissolubly united within God's act of creating itself. So Descartes's claim that the form preexists in the efficient cause maintains, from the side of the causes, that in divine nature there is no distinction between the reason and the action that unconditionally bring things into existence. This doesn't, in itself, explain why Descartes privileges the efficient cause. However, further consideration of the import of Descartes's reasoning from the side of the causes makes this clear.

The incomprehensibility of God's inner essence means that we cannot grasp the immensity of his infinite power. Nevertheless, we can apprehend (not comprehend) the causal action of that power in virtue of its created effects visible to us in the world. This affords grounds for privileging the

[2] May 27 letter to Mersenne cited above; in *Principles* (1644) Part I, article 23, Descartes makes a similar statement. We must "suppose that there is always a single identical and perfectly simple action by means of which he [God] simultaneously (*omnia simul*) understands, wills, and accomplishes everything" (AT 8A:14; CSM 1:201). In the *Second Reply* (1641) Descartes says: "the entire universe can be said to be an entity originating in God's thought, that is, an entity created by a single act of the divine mind"(AT 7:135; CSM 2:97). Then he writes to Mesland on May 2, 1644, that between God's will and understanding there is no priority "for the idea which we have of God teaches us that there is in him only a single activity, entirely simple and entirely pure" (AT 4:113; CSMK 119). Finally, in 1648, Burman queries article 23, Part I of the *Principles* and asks whether God's decrees threaten divine immutability. Descartes replies that God's decrees are set from eternity: "In reality the decrees could not have been separated from God; he is not prior to them or distinct from them, nor could he have existed without them. So it is clear enough how God accomplishes all things in a single act" (AT 5:166; CSMK 348).

action of the efficient cause and its effects, since the effects are an expression of the immensity of God's creative activity. Thus, to this extent the creative act is rendered intelligible in terms of the action of a total efficient cause. Now, since understanding and willing are indistinguishably the same in God, the efficient cause (identified with willing) and the formal cause (identified with understanding) cannot be distinguished either. Furthermore, since Descartes's conception of the total efficient cause requires it to be a productive cause, causal action must be paramount. Suárez makes the point forcibly: "It is necessary to note the difference between . . . the causality of the form and the action, which we say follows from the causality of the efficient: because the action is thus the causality of the agent, as agent, and to the extent it is the agent, which resides entirely outside in its effect" (DM 15.6.7, 1:520; he makes the same point in DM 27.1.10, 1:952).

It is clear enough that, for Suárez, the efficient cause is the *per se* and extrinsic principle of action; it is also the sole active cause since anything that comes to be depends on its action. Descartes may well have appropriated this position. But he is more radical. For Suárez, the causality of the material and formal cause still contributes to causal outcomes despite its dependence on the action of the efficient cause. But this is precisely what Descartes denies. For him, there is only one form of causality and one principle of explanation—the action of the efficient cause. If Suárez subordinates the other causes to the efficient, Descartes eliminates them entirely. There is a historical irony here. At the very time he asserts the uniqueness of the efficient cause, Descartes restricts the notion of causal agency to the action of the will, whether to God's will or to created wills. In short, an efficient, secondary cause of the sort that Suárez championed is nowhere found in Descartes's mature natural philosophy.

God, Time, and Continual Creation: The Emergence of Re-creationism

The period from the *Meditations* (1641) stretching through the *Objections* and *Replies* to the *Principles* (1644) witnesses a shift in Descartes's understanding of divine efficient causation. This occurs in *Meditation* III, where he articulates a new conception of the standard theological doctrine that creation and conservation are only conceptually distinguished. In *The World* Descartes says that "God continues to conserve [matter] in the same way that he created it" (AT 12:37; CSM 1:94). Later in chapter 7 he generalizes this by saying that each thing is conserved "not as it may have been some time earlier but precisely as it is at the very moment that he conserves it" (AT 12:44; CSM 1:96). Certainly, Descartes claims that

God conserves things in the same state in which he creates them initially: their continued existence in a moment demands no less a cause than that required to create them in the first moment. But this is just to say that creation and conservation are one and the same act in regard to divine nature. Nor does the *Discourse on Method* (1637) indicate that Descartes has before him a principled and explicit view in regard to time and creation. He maintains there only that all beings "depend on God's power in such a manner that they could not subsist for a single moment without him" (AT 6:36; CSM 2:29). He adds that theological opinion agrees that "the act by which God now conserves it [the world] is just the same as that by which he created it" (AT 6:45; CSM 2:133). We will argue that the ontology of creation articulated in the *Principles* turns on a temporalized conception of God's simultaneous act of creation/conservation, and that it *first* emerges in *Meditation* III. Furthermore, in our view, it's important to note that the context in which it emerges is causal. In *Meditation* III, Descartes is searching for the cause of his existence, and is exploring the consequences of the cogito argument of *Meditation* II. For the first time in *Meditation* III, we maintain, Descartes argues that God's power to create and conserve is to be conceived, as it were, as being present in each instantaneous and separate part of time. In short, Descartes espouses recreationism, the view that God's superabundant power is such that the world can be conceived to be created/conserved anew in each independent moment of time.

In the course of our analysis we will consider two opposing interpretations. Geoffrey Gorham has argued that the independence of the parts of time turns on Descartes's prior assumption that causes and effects are necessarily simultaneous (2004, 390). We will argue that both conceptions combine together in the arguments for divine existence in *Meditation* III, and that neither is a prior assumption on Descartes's part. If correct, our account provides a reason for Descartes's commitment to the view that the parts of time are nonoverlapping. But it also explains why he arrives at the view that God's exercise of creative power may be conceived in this way given that we possess an innate notion of the self's existence in relation to divine existence. Furthermore, we will oppose the view that Descartes's argument concerning time turns on assuming a principle of logical independence. This says that "x exists at t" and "x exists at t_1" are logically independent; to affirm one and deny the other is not contradictory. This is correct. However, when applied to creaturely existence, we will argue, it reflects the contingency of that existence. Moreover, the assumption of logical independence is not a premise from which Descartes's re-creationist argument proceeds. And in any event, an appeal to logical independence is not sufficient to show that Descartes affirms

the independence of the parts of time on purely logical and not on causal grounds. The context of the re-creationist argument is thoroughly causal.

So let's turn to the *Meditations*, the pertinent *Replies*, and the *Principles*. In *Meditation* III (1641), Descartes examines and rejects the notion that he is self-caused, and also the supposition that if he has always existed he doesn't need a cause for his existing. To justify his position he puts forward, for the first time, the following argument:

> For a lifespan can be divided into innumerable parts, each completely independent of the others, so that it does not follow from the fact that I existed a little while ago that I must exist now, unless there is some cause which creates me again, as it were, at this moment (*me quasi rursus creet ad hoc momentum*)—that is, which conserves me. For it is quite clear to anyone who attentively considers the nature of time that the same power and action (*eadem plane vi & actione*) are needed to conserve anything at each individual moment of its duration as would be required to create it anew (*de novo*) if it were not yet in existence. Hence the distinction between conservation and creation is only a conceptual one, and this is one of the things that is evident by the natural light. So what I must now ask myself is whether I have the power of bringing it about that I, who now exist, shall also exist a little while from now: for since I am nothing other than a thinking thing (*res cogitans*), or at least I am now dealing with that precise part of me which is a thinking thing (*res cogitans*), I should undoubtedly be conscious (*conscius*) of any such power were it in me. Now I find I have none: and this very fact makes me realize most clearly that I depend on some being other than myself. (AT 7:49; CSM 2:33)

In the mature *Principles* (1644) Descartes argues that the very fact that we exist is sufficient proof of God's existence, especially if we attend to the nature of time:

> For the nature of time is such that its parts are not mutually dependent, and never coexist. Thus, from the fact that we now exist, it does not follow that we shall exist a moment from now, unless there is some cause—the same cause which originally produced us—which continually reproduces us, as it were (*veluti*) anew ["as it were" is dropped in the French edition of 1647]; that is, conserves us. For we easily understand that there is no power in us by which we may conserve ourselves; and that He in whom there is so much power that He can conserve us separately from Himself, must also conserve Himself all the more, or rather, must require no conservation by anyone, and finally, must be God. (I.21; AT 8.1:13; CSM 1:200)

Notice in the *Principles* that the argument has shifted from the first- to the third-person pronoun. Notice also in the geometrical appendix to the *Second Reply* (1641) that Descartes gives to the claim, that the parts of time are mutually independent, the status of a common notion or axiom: "There is no relation of dependence between the present time and the immediately preceding time, and no less a cause is required to preserve something than is required to create it in the first place" (AT 7:165; CSM 2:116). Thus, the notion that the parts of time are independent is used with the status of a common notion in *Meditation* III, the *First* and *Fifth Replies* to Caterus and Gassendi, as well as in the *Principles* (AT 7:110, 255; CSM 2:79, 255).

These arguments represent, we claim, a new development in Descartes's understanding of God's creative power. As earlier in *The World*, Descartes conceives God to be the cause that creates and continually sustains things in existence. But now he explicitly connects God's creative action with the innately common notion that the parts of time are separate and independent. That is, God is now conceived to be the cause who creates and conserves things in existence in one individual "part" of time and again in the same way in each successive and separate part. In short, Descartes articulates an ontology of creation that combines two claims: (1) that the parts of time are causally independent of one another, and (2) that what occurs in our conception of each separate part of time is caused immediately by God. In the *Meditation*s, he bases his account of creation on an ontology of the continual creation of himself. But in the *Replies* and the *Principles* he extends this ontology to the continued existence of humans and nonhumans alike. This explains the shift to third-person pronoun in the passage from the *Principles* just quoted.

But let's step back and examine more closely Descartes's arguments to see how he establishes this position. In the *Fifth Objection*, Gassendi attacks the notion that a human lifetime has parts, each of which is independent, and also Descartes's conclusion, namely, that his life must be created anew in each individual and separate part of its duration. He begins by claiming that Descartes's position can be understood in another way:

> But you say that the parts of your lifetime are "independent of each other." Here I am tempted to ask if we can think of anything whose parts are more inseparable from one another than your duration. Can we think of anything whose parts are more inviolably linked and connected? . . . But not to press the point, what difference does this dependence or independence of the parts of your duration make to your creation or conservation? Surely these parts are merely external—they follow on without playing any active role. . . . You say that from the fact that you existed a little while ago it does not follow

> that you must exist now. I agree; but this is because there is no guarantee that there is not some cause present which might destroy you, or that you may not have some weakness within you which may now finally bring about your demise. (AT 7:301; CSM 2:209–10)

Gassendi makes two points. First, he views time as an abstract grid, neutral with respect to the types of events or objects that fill it. He asks, assuming this "externalist" picture of time, what difference it makes whether its "parts" are independent or not? In other words, he sees no intrinsic connection between time and the divisions that a human lifetime may fall into. Second, he rejects Descartes's claim that, having failed to detect within himself a power to ensure his continued existence, it is necessary there be a cause that conserves his existence in the sense of "renewing" it continually in each separate and successive moment. For Gassendi, continual existence simply presupposes the good order of our natural constitution and an avoidance of internal or external causes that may affect it: "So, you will indeed continue to exist, not because you have some power which creates you anew, but because you have a power sufficient to ensure that you will continue unless some destructive cause intervenes" (ibid. 302; 210). He agrees with Descartes that he is not self-caused and that his existence depends on something other than himself: but "not in the sense that you are created anew by this being, but rather in the sense that you were once created by it" (ibid.). In other words, for Gassendi, if anything exists and endures, it does so simply in virtue of its created nature under God's ordinary concourse.

Descartes's response is blunt. He notes that Gassendi fails to see the implications of the distinction between causes of coming to be (*secundum fieri*) and causes of being (*secundum esse*): "When you deny that in order to be kept in existence we need the continual action of the original cause, you are disputing something which all metaphysicians affirm as a manifest truth—although the uneducated often fail to think of it because they pay attention only to the causes of coming into being and not the causes of being itself" (AT 7:369; CSM 2:254). He implies (correctly) that Gassendi's reasoning proceeds in terms of the former conception, according to which the presence of the cause is not needed for its effect to continue once it is produced. But according to Descartes's interpretation of a cause of being, such as the sun's action in producing light, or God's in creating things de novo, the cause "must always continue to act on the effect in the same way in order to keep it in existence. This can be demonstrated from my explanation of the independence of the divisions of time. You try in vain to evade my argument by talking of the necessary 'connection' which exists between the divisions of time considered in the abstract. But this is not the issue: we are considering the time or duration of the thing

which endures, and here you would not deny that the individual moments can be separated from those immediately preceding and succeeding them, which implies that the thing which endures may cease to be at any given moment" (AT 7:370; CSM 2:255; see also the June 4, 1648, letter to Arnauld; AT 5:193; CSMK 355). In other words, for Descartes there is nothing contained in the occurrent content of a thought at a given moment that ensures that the thinker will continue to exist as a thinking thing into the next moment.

Of course, Descartes doesn't deny, as Gassendi seems to suggest, that orderly experiences of the world demand a sense of temporal continuity. But this is not Descartes's argument. His point (and it is a deep shift in his thinking) is that the continuity of his existence is rooted in the action by which God re-creates him from *one separate moment to the next*. At this point in *Meditation* III, Descartes is a disembodied meditator indebted still to the cogito mobilized in *Meditation* II, aware only of the immediate content of various sorts of ideas in his mind, and unable initially to establish that these ideas refer to anything apart from his mind (AT 7:49, 50; CSM 2:34, 35). Significantly, the cogito in *Meditation* II is mobilized as an intellectual *performance* tied intimately to the very moment of time in which it is performed. Notice that it's a performance, an *act* of thinking, and not merely the awareness of an unattached and free-floating innate truth. In other words, the cogito exercise involves both a contentful thought and the simultaneous affirmation of existence by the will. In stark contrast to its dynamic deployment in *Meditation* II, in the *Rules* the cogito is merely cited as an example, among others, of a clear intuition or common notion (AT 10:368; CSM 1:14). Although the cogito is employed as a performative act in the *Discourse*, significantly Descartes does not tie it to the individual instant of time in which it is performed (AT 6:33; CSM 1:127). Furthermore, the cogito is found neither in use nor in mention in *The World*. In short, in *Meditation* II, for the first time, the cogito is put to work to illuminate philosophically how *we must conceive* our immediate existence, and, as such, it *is still at work* in *Meditation* III in the context of Descartes's arguments for divine existence. Through the exercise of the cogito, Descartes assures himself of his existence *at each* and every moment *in which* he thinks, by means of a self-certifying intuition that is noninferential and nonpropositional (see below). Moreover, on reflecting on the implicit content of the cogito, he grasps that he is a thinking thing by mobilizing two general notions—"thing" and "thought"—that he extracts from an inner awareness of himself (AT 7:28; CSM 2:19). In *Meditation* III, however, he has not yet established that he has the power to continue thinking, or that he will always continue to think or, on examining the immediate contents of his thinking, that he possesses a power that enables him "to bring it about that I who

now exist will still exist a little while from now." For surely, "if there were such a power in me, I should undoubtedly be aware of it" (AT 7:49; CSM 2:33–34). So, at this point in the *Meditation*, Descartes can conclude only that the fact he exists in the moment of thinking is dependent upon a power other than himself and, having ruled out other putative causes, now sees a path open for showing that this power can only be God.

In *Meditation* III, prior to the life-span argument, Descartes explores the ideas his mind possesses. He states that "apart from the idea which gives me a representation of myself, which cannot present any difficulty in this context, there are ideas which variously represent God, corporeal and inanimate things, Angels, animals and finally other men like myself" (AT 7:43; CSM 2:29). He focuses then on his idea of God, whose objective content he takes to be that of an infinite substance, despite his being a finite and disembodied meditator (ibid. 45; 31). He claims that this idea is "utterly clear and distinct (*maxime clara & distincta*): for whatever I clearly and distinctly perceive as being real and true, and implying any perfection, is wholly contained in it." Moreover, although his mind is unable to comprehend God's immense infinitude, it is nevertheless sufficient, Descartes claims, that he "understands the infinite" and can judge that God possesses the sum of all perfections either "formally or eminently." He goes on to argue that if he possessed only potentially an idea of divine perfection, this would be inconsistent with the content of the idea he has, which is that of an actually perfect being. And this being of which he has this idea, he concludes, is God, who is "actually infinite, so that nothing can be added to His perfection," nor can anything be detracted from it, as would be the case of an idea that is his own invention. Thus, the "objective being of an idea (i.e., that of an infinite being) cannot be produced merely by a potential being, which strictly speaking is nothing, but only by an actual or formal being" (ibid. 46–47; 32).

This pattern of reasoning brings us to the phenomenology of the life-span argument. Why does Descartes's ontology of continual creation, the claim that we conceive God's act of efficient causation to inhere in each independent moment of time, emerge as it does in *Meditation* III? The meditator has argued that his innate idea of an infinite substance must proceed from a being that is actually and substantially infinite. He has also argued that this idea is "utterly clear and distinct, and contains in itself more objective reality than any other idea" (ibid. 45; 31). Thus, the meditator's idea is a highly evident intuition, the content of which is inscribed within the act that thinks it and, at the same time, is directed toward God as its copresent cause. So, in each *momentary* act of thinking the idea of an infinite and perfect being, the meditator is assured that God exists and that the meditator exists. The idea of the self and the idea of God are indissolubly connected. "I recognize that it would be impos-

sible for me to exist with the kind of nature I have—that is, having within me the idea of God—were it not the case that God really exists" (AT 7:52; CSM 2:35).

At this point, Descartes's argument takes a new direction. He asks whether he, who has this idea of a more perfect being than himself, would exist "if no such being existed. Now from what source could I have my being? Either from myself, or from my parents, or from some things, whatever they may be, less perfect than God" (AT 7:52; CSM 2:32). Having ruled out that he or something less perfect than himself is the cause of his existence, Descartes turns to the life-span argument, which, we are now in a position to show, is connected intrinsically to the cogito. Recall what the meditator knows at this point. He knows that the performance of the cogito is temporally indexed, and that his existence is insured only in the *very* moment at which the cogito is performed. He also knows that he has not caused the innate idea he possesses of an actually infinite being, and that something apart from himself must be its cause (AT 7:42; CSM 2:29). He has argued, eliminating other putative causes, that God alone is the copresent cause of that idea, and is the copresent cause of himself, the finite being who possesses it. He knows, most importantly, that these conclusions are valid only within the cogito *at the very moment* it is performed. Furthermore, he knows that he lacks any basis for supposing he will continue to think or that he will always continue to think. Hence, given that the meditator is assured he exists only in the moment of thinking, and given that God is the cause of his existence in that moment, it follows that the meditator's existence must be conserved by God in the same way at each separate moment of time in which the meditator performs the cogito. Accordingly, the time-indexed structure of the performance of the cogito drives the time-indexed structure of the life-span argument. The reason is because the meditator's claim that his life's duration is made up of countless independent parts is intrinsically connected to the performative character of the cogito; its truth is tied to each independent moment in which it is performed. Thus, according to the meditator's conception of his existence, God's conservation is inherently present in each separate and successive moment in which the meditator endures, just as it was in the initial moment of his creation. In short, Descartes's picture of continual creation emerges, in *Meditation* III, from the implications of the cogito, the chief of which, given the temporalized nature of its performance, is that he must conceive his continued existence to be inscribed in God's action of re-creating him from moment to moment. From this perspective, the life span, the duration of which is re-created from moment to moment, is the inner awareness of a thinking thing who successively performs the cogito.

Thus, Descartes's re-creationism is tied to the supposition that he is a disembodied thinker, at a stage in his meditation prior to his being able to establish, as he does in *Meditation* VI, that he is a mind-body composite who exists in the physical world. This style of metaphysical reasoning is foreign to *The World*. Indeed, it is nowhere present, or even presupposed, in chapters 6 and 7, in which Descartes discusses God's relation to creation. It is uniquely within the meditative framework of *Meditation* III that the cogito and the life-span arguments come together. And in so doing, they provide a reason, from within the dynamics of Descartes's thinking, that explains his espousal of re-creationism and his commitment to the causal independence of the parts of time. But this conceptual conjunction was probably *not possible* prior to the advent of Descartes's sustained metaphysical journey in the years 1637–41. In the *First Reply* he extends the argument to bodies, as well as to any created thinking thing: "The separate divisions of time do not depend on one another. Hence the fact that the body in question is supposed to have existed up to now 'from itself,' that is, without a cause, is not sufficient to make it continue to exist in the future, unless there is some power in it that reproduces it continuously, as it were (*continuo veluti reproducens*)" (AT 7:10; CSM 2:79). Thus no created nature, animate or inanimate, possesses the power necessary for sustaining itself in existence.

The important consequences of this change in Descartes's thinking can now be made apparent. During the period of the *Meditations* he establishes a new understanding of the axiom that efficient causation imparts existence to its effect. Traditionally the doctrine of creation/conservation implies that causality and existence are coextensive notions, namely, that the fact of existing is interchangeably connected with God's copresent act of primary, efficient causation. The doctrine's logic is this: If anything is created, God conserves it at each moment it exists in the same way and for the same reason that he creates it initially. In other words, God's active conservation is necessary for a thing to remain in existence for a second moment. But it's absurd that it be more dependent on God in the second moment of existing than it is in the first. On the contrary, its existence depends on God in the first moment for the same reason it does in the second moment: it is a being other than God and can exist only to the extent it participates in God's causation. In *Meditation* III, Descartes transforms this traditional doctrine from the view that creation is *prolonged* to the notion that creation is *renewed*: he now conceives the act of *being caused* to be interchangeably connected, *in each causally separate moment of time*, with the *fact* that something's existence is being conserved *at that very moment*. In short, awareness of the nonoverlapping nature of time and awareness of the contingency of existing things are two sides of the same coin. Thus, to claim that our conception of the

mutually independent "parts" of time ensures for us the necessity of God's continual causation is just to say that existing things depend at each separate moment of their existence on God as their cause. Thus, the principle that cause and effect are simultaneous is not the premise that drives Descartes's argument that the parts of time do not overlap. Both notions come into play together within the context of Descartes's re-creationist argument. From the *Meditations* onward, this metaphysical/theological commitment is the basis of Descartes's view that efficient causes *in action* are copresent with their effects, that a cause genuinely produces its effect only *at the very moment* it is affecting, and that a productive efficient cause is such that its effect follows *per se* from its nature alone.

It is important that the full implications in this shift in Descartes's causal thinking be grasped. If, as he now explicitly holds, a cause causes only at the moment it affects, fundamental or *per se* causes cannot be prior to their effects. Indeed, the cogito and the life-span arguments combined together now ground Descartes's belief that causes and effects are necessarily simultaneous. But if causes can't be prior to their effects, and if a life span is divided into countless nonsimultaneous stages, it follows that no stage of that life span is causally sufficient for any later stage. In other words, Descartes denies that there are real and diachronic causal relations among created things: something can no more act *when it is not* than *where* it is not (see also Gorham 2004). Descartes makes this explicit in a letter of 1641: "For I admit I am not subtle enough to grasp how something can be acted upon by something else that is not present—which may, indeed, be supposed not to exist anymore, like a whip if it should cease to exist after whipping the top" (AT 3:428; CSMK 193). But since, in Descartes's view, everything must have a cause, and if no diachronic causal relations exist among created things, there must be an ultimate external cause for the continuing existence of things: this can only be God. It's important to see that Descartes intends his argument to show that any lapse of time can be divided into segments that are *causally* independent (see Secada 1990, 47). Thus, the endless debate as to whether Descartes espouses temporal atomism, or whether each part of time is indivisible or not, is irrelevant to a proper understanding of his argument (see Garber's discussion [1992, 266–73]). What is significant for Descartes's argument is that the parts of time are causally independent. This view in no way entails God's existence in time, since nothing follows concerning the nature of divine existence from how *we conceive* the world according to its re-creation in the separate parts of time. Descartes is emphatic that God is simple, atemporal, and unconstrained—doctrines entrenched in the theological tradition he follows and doesn't wish to impugn. It is from the nature of God that continual creation flows, a God who, for Descartes, is immeasurable, great, and transcendently omnipotent. Given the dimin-

ished status of human nature in relation to God's, and given the nature of the proofs of God's existence in *Meditation* III, it is hardly surprising that it is we who conceive God's creative power according to the notion that the parts of time are causally independent of one another. Notice also that this is not an argument for the origin of time. On the contrary: it shows dramatically the extent to which our thinking concerning the creative act of God's transcendent power is tied to the representation of time. If the argument is seen in this light, it is apparent why Descartes uses the qualifying phrase "created anew, as it were (*veluti*)" in setting it out.

This brings us to the claim that Descartes affirms the independence of the parts of time on logical, not causal, grounds. Let's make clear our claim that the parts of time are causally independent. Reflecting on the cogito act, performed at a particular time, yields an immediate awareness that my existing at this moment of thinking in no way entails my existing in a later part of time. In other words, I grasp the utter *contingency* of my existence, which, as such, affords no ground for supposing its continuation. This means that I experience, in an act of reflective awareness at a particular time, that nothing in my nature, no intrinsic cause, will ensure the conservation of my existence into the next part of time. What I know in performing the cogito is that I exist at *this* moment of thinking; but my grounds for supposing my continued existence in subsequent parts of time rest on God's act of creating/conserving me in every future, nonoverlapping temporal stage of my existence. It's the content of this thinking, yielded by the cogito, that supports the claim that the nonoverlapping nature of time and the contingency of created existence are two sides of the same coin. But what is the nature of contingency as revealed in the performance of the cogito? It is that created things lack the ground of their own existence. It follows that no contradiction ensues if we say that they might fail to exist in the next separate part of time. It is clear, then, that the argument for the independence of the parts of time invokes both logical and causal principles. This is just what we would expect, since logical principles have to be interpreted in the context of the argument at hand. In this case, that context is causal through and through.

This brings us to an important point. Does the tying of the cogito and the life-span argument to time, in the manner of our interpretation, commit Descartes to the view that thought processes of created beings have a *continuous* temporal duration in time? More specifically, is the cogito such that it involves, ipso facto, an awareness of continuous time? In our view it does not. Our analysis of the performative nature of the cogito should make clear that for Descartes its validity is an immediate *intuition* of a truth contained in an idea grasped in an instant, an intuition that contains no temporal successiveness. On this reading, each individual moment is instantaneous, and the content of the *I think* is not prolonged

through continuous time. Thus, on our reading, Descartes holds that the affirmation of the self's existence from the *I think* does not depend upon an awareness of a temporal duration in which the *I think* occurs. In other words, according to the reading we endorse, Descartes need not accept the view of his seventeenth-century contemporary, Desgabet, that the cogito argument fails to go through unless bodily existence is assumed and with it a notion of successiveness that depends on a movement in time external to thought (Schmaltz 2002; and Ariew 1999, 188–205 for an account of other seventeenth-century reactions to the cogito).

It seems apparent in *Meditation* III that Descartes does not conceive human thought as taking place entirely within a continuous temporal duration. Indeed, he explicitly holds that we can conceive the self as a thinking thing independently of any conception of the body (see *Third Reply* (to Hobbes) AT 7:174–77; CSM 2:123–15). The cogito reflection turns on an awareness that we exist as a thinking thing prior to knowing that we are linked to a body. Consequently, through pure thought we grasp that we exist prior to being able to establish that we are a mind-body union. After all, as Descartes makes abundantly clear in *Meditation* III, the innate ideas we possess of the self and God are unique. But he also makes clear that he is appealing to a mental intuition with roots in the *Rules*. This is the notion that we possess mental acts whose content is such that we are not "aware of a movement or a sort of sequence," as is the case in deductive chains of reasoning—but are simply aware of an "immediate self-evidence," independent of memory (Rule 3; AT 10:370; CSM 1:15). Thus, for this sort of mental intuition two conditions are necessary: (*a*) It must be grasped clearly and distinctly, and (*b*) "the whole proposition must be understood all at once, and not bit by bit (*tota simul et non successive*)" (Rule 11; ibid. 407; 37). The cogito fits these conditions perfectly and is compatible, moreover, with the claim that bodily based thought is discursively divisible in time.

But how do we square our interpretation with Descartes's statement to Arnauld that the duration of the human mind is not "entirely simultaneous like the duration of God; because our thoughts display a successiveness which cannot be attributed to the Divine thoughts" (June 4, 1648; AT 5:193; CSMK 355). Descartes draws a contrast here between divine nature, as such, and human thinking that is played out discursively in time. This is not, however, incompatible with Descartes's claim that there are truths, such as those revealed by the cogito, grasped through immediate intuition. Accordingly, precisely *at the moment in which the meditator attends to what he clearly and distinctly grasps*, the content of what he grasps is self-guaranteed epistemically (see the *Second Reply;* AT 7:140; CSM 2:100). Indeed, without this conception of what counts as an evident intuition Descartes could not articulate the foundational rela-

tionship between self and God necessary for the proof of divine existence in *Meditation* III and subsequently for the existence of the external world. Thus, Descartes makes a clear distinction, in the *Second Reply*, between the truth of a mental content to which we immediately *attend* and that truth recalled by memory when the initial intuition is no longer attended to. He illustrates his point in reference to the cogito: "When someone says 'I am thinking, therefore I am, or exist,' " he does not deduce existence from thought by means of a syllogism, but recognizes it as something self-evident by a simple intuition of the mind (AT 7:140; CSM 2:100). In other words, we draw the general principle "Whatever thinks exists" from a particular exercise of the cogito, since it is precisely in the context of its performance that we think the general principle, and grasp its application to our own existence.

The priority to which we attend in the cogito performance is our immediate awareness of the primitive act of thinking/existing. At this primitive level we are not similarly attentive to the general notion that "everything which thinks exists" (cf. Burman; AT 5:147; CSMK 333). Descartes makes the same point in response to Gassendi's criticism of the cogito in the French translation of the *Replies* of 1647 (AT 9.1:205ff.). In addition, in a dialogue probably written late—*The Search after Truth*—he denies the need to define "existence," "doubt," and "thought" before we can think "I doubt, therefore I exist" or "I think, therefore I exist." These sorts of truths we learn only "by ourselves: what convinces us of them is simply our own experience or awareness—that awareness or internal testimony which everyone experiences within himself when he ponders such matters" (AT 10:524; CSM 2:418). This is Descartes speaking in the meditative genre of the *Meditations* that enjoins the reader to retreat from the senses and to think through the mind's cognitive exercises in the order in which they are presented (Hatfield 1986, 44–48; 2003, 42). We must be careful, however, as we'll see in chapter 5 when we consider Descartes's views on innateness, not to misunderstand his view of the cogito. He's not asserting that it establishes knowledge of the particular to be logically prior to the general. Rather, his concern is to force our attention on what is implicit in the individual experience or consciousness of the cogito before we reflectively make explicit the notions that it contains.

We noted above that Gassendi challenges Descartes's claim that his existence continues only if a copresent cause necessarily creates him anew in each separate part of time, stating that Descartes confuses two sorts of causes. On the one hand, certain efficient causes, in order to produce effects, need to be "continuously present if they [the effects] are to keep going and not give out at any given moment" (AT 7:301; CSM 2:209). But on the other, some effects continue even when the "cause is no longer active" and "if you like, when it is destroyed and reduced to nothing"

(ibid.). Gassendi then claims that a cause of this type is sufficient for explaining Descartes's continued existence without invoking a cause that creates him "anew in each individual" part of time (ibid.).

Gassendi clearly misses the thrust of Descartes's position. Descartes does not deny that his parents caused his existence; but that is simply a contingent causal fact about his personal history. He tells us in *Meditation* III that his parents did not conserve his existence. Indeed, "insofar as I am a thinking thing (*res cogitans*), they did not even make me; they merely placed certain dispositions in the matter which I have always regarded as containing me, that is my mind (*hoc est mentis*), for that is what I now take myself to be" (AT 7:50–51; CSM 2:35). At the end of *Meditation* III, Descartes is still a disembodied meditator, a thinking thing whose continued existence depends on God, the very point that Gassendi's objection fails to address. He makes this causal point explicit to Claude Clerselier on April 23, 1649. Agreeing that his parents caused his bodily existence, he says he "cannot imagine that they made me, in so far as I consider myself as a thing which thinks, because I see no relation between the physical act by which I am accustomed to believe they begat me, and the production of a substance that thinks" (AT 5:357; CSMK 378). In other words, Descartes's bodily existence and his existence as a thinking mind demand different orders of causation, namely, the "horizontal" and the "vertical." It's this distinction Descartes probably has in mind when he distinguishes his use of the cogito from Augustine's. Descartes states that although Augustine "does use it to prove the certainty of our existence," he "on the other hand, [uses] the argument to show that this I which is thinking is an *immaterial substance* with no bodily element" (to Colvius, November 14, 1640; AT 3:247; CSMK 159).

As noted previously, there's no indication, prior to the *Meditations*, that Descartes's conception of God's causal action in the world involves an explicit view that the parts of time are separate and nonoverlapping. But in the period from 1641 to the end of his life this conception plays a significant role in Descartes's thinking. For example, in his *Conversation with Burman* (April 16, 1648), he connects eternal duration and his view of time: "If I existed from eternity, the parts into which my duration is divided would be separated, and they would none the less depend on God" (AT 5:155; Cottingham 1976, 16). In a letter to Hector-Pierre Chanut (1647) he says that the matter of which the world is made "will never pass away" because of "the promise of eternal life for our bodies." Nevertheless, "no one infers from the infinite future duration due to the world that it must have been created from all eternity; because every moment of its duration is independent of every other" (June 6, 1647; AT 5:53; CSMK 320). There seems to be little doubt that from the *Meditations* onward Descartes conceives God's creative action in terms of a temporally indexed ontology of created things.

Causal Axioms and Common Notions

Descartes employs a panoply of causal concepts throughout his works. In the *Discourse* (1637) causal notions are present implicitly, although not invoked as such. For example, as we note in the third section of the present chapter, Descartes appeals to the causal perfection principle, a principle explicitly mobilized in the two-part argument for God's existence in *Meditation* III (1641). In the *Discourse*, he asks how it is possible that he has a notion of something more perfect than his nature, especially the idea, which he takes to be innate, of an infinitely perfect being: "For it was manifestly impossible to get this from nothing; and I could not have got it from myself since it is no less contradictory that the more perfect should result from the less perfect, and depend on it, than that something should proceed from nothing" (AT 6:3; CSM 1:128). Here he invokes two causal concepts or common notions, which he uses more explicitly later: *ex nihilo nihil fit* and the axiom that cause and effect must have equal perfection, otherwise something comes from nothing. It is important to recall that these common notions, as ideas in the mind, are not human constructs, but are grounded in God's causation. So he writes later in the chapter: "what I took just now as a rule, namely, that everything we conceive very clearly and very distinctly is true, is assured only for the reasons that God is or exists, that he is a perfect being, and that everything in us comes from Him. It follows that our ideas or notions, being real things (*choses reeles*) and coming from God, cannot be anything but true, in every respect in which they are clear and distinct" (AT 6:38; CSM 1:110). This is the first articulation of the rule of truth that figures prominently in the *Meditations*.

Notice Descartes's claim that our "ideas or notions" have a *real* mode of being in the mind and are put there, that is, caused, by God. So in the *Discourse*, his first published work, Descartes states straightforwardly that ideas are something and, like any existing thing, must have a cause: in the case of the idea of an infinitely perfect being that can only be the copresent action of God's efficient causality. Caterus criticizes this line of reasoning in the *First Objections*. But Mersenne, Arnauld, Gassendi, and Descartes's disciple Regius also object to the view. For instance, in June 1642, Descartes says to Regius: "To solve your objection about the idea of God, you must observe that the argument is based not on the essence of the idea, by which it is only a mode existing in the human mind and therefore no more than a human being, but on its objective perfection, which the principles of metaphysics teach must be contained formally or eminently in its cause" (AT 3:567; CSMK 214). In March 1642, he says to Mersenne, "although the objective being of an idea must have a real cause, it is not always necessary that this cause should contain it formally,

but only eminently" (ibid. 545; 211). These statements occur after the publication of the *Meditations* and the *Replies*. It's not clear, therefore, whether Descartes when writing the *Discourse* (or indeed earlier) had already linked the technical terms "objective," "formal," and "eminent" to the reality of ideas and to the level of perfection their causes possess. However, these metaphysical conceptions, and their relationships, are used in the *Meditations*, the *Replies*, and *Principles* with a level of sophistication and depth not even implicit in the *Discourse*.

In the *Meditations*, Descartes employs these conceptions to mark distinctions among things positioned within causal relationships that involve different levels of perfection. They apply to God's causal action in the world (vertical causation) and to causal *relata* among things in the created order (horizontal causation). For Descartes, creation is a coordinated and harmonious relationship between the effects of divine causation, as they descend "vertically" into the world, and causal relations and roles present within the created—horizontal—order (see the section of chapter 3 entitled "Eminent Containment, Transcendence, Divine Powers, and God's Causal Harmony"). From first to last Descartes is a causalist. But in our view, even in the *Meditations*, he has yet to work through the implications of his position. Only in replying to his objectors is he forced to think more carefully about his causal commitments, especially about their epistemic implications. This development in his thinking, so evident in the *Fourth Reply* to Arnauld, will contribute to the emergence of what we call his epistemic stance.

Six causal axioms or common notions appear frequently in Descartes's work from the *Meditations* onward. He calls them *common notions* since they are self-evident and *axioms* because their epistemic status is worthy of unquestioned belief. We state them separately, to indicate different facets of Descartes's causal reasoning, but all are interconnected conceptually, and appear as such in Descartes's mature work. These axioms are general statements that apply to sorts or kinds of things, and for Descartes each is known innately. There is also a seventh notion, never called an axiom, that nevertheless is an essential feature of Descartes's reasoning about the nature of God's causality.

1. *The causal existence axiom*. There is a cause for everything; or, equivalently, something cannot come from nothing: *Ex nihilo nihil fit*. In *Meditation* III, after he introduces his conception of the efficient and total cause, Descartes states that the reality of an effect can arise only from a cause: "And how could the cause give it to the effect unless it possessed it? It follows from this . . . that something cannot arise from nothing" (AT 7:4; CSM 2:28). Common notion III of the *Second Reply* states: "It is impossible that *nothing*, a non-existing thing, should be the cause of

the existence of anything, or of any actual perfection in anything" (ibid. 165; 116). In these contexts, Descartes focuses on the primary efficient cause, but the axiom applies to any causal situation. Recall from chapter 2 that to be a cause, in the sense of a principal efficient cause, is to be the cause of something's being. For Descartes, the primary efficient cause plays this role preeminently, since only through its action does anything exist. So the claim that the reality of an effect arises from the efficient cause that possesses it does not presuppose the *ex nihilo nihil fit* notion: on the contrary, that notion presupposes it. In short: given the truth of the tag *non est causa, nisi efficiens*, without the action of the efficient and total cause nothing could exist. Thus it is not ex nihilo but *ex Deo* that things are created de novo.

2. *The causal perfection axiom*. The more perfect cannot arise from what is less perfect: "that which is more perfect—that is, contains in itself more reality—cannot arise from what is less perfect" (AT 7:40; CSM 2:40). This axiom is first introduced in *Meditation* III, in regard to God's efficient and total causation, but its scope applies to any causal situation. We call this the causal perfection axiom. In essence it states: "There is nothing in the effect which did not previously exist in the cause," and this implies that the lesser cannot cause the greater (*Fifth Reply* to Gassendi; AT 7:366; CSM 2:252). The opposite, however, is not true; "in the case of a universal and indeterminate cause, it seems to me a common notion of the most evident kind that 'whatever can do the greater can also do the lesser' (*quod potest plus, potest etiam minus*); it is like the maxim that 'the whole is greater than the part' (*totum est maius sua parte*). Rightly understood, this notion applies also to all particular causes" (letter to Mesland, May 2, 1644; AT 4.3; CSMK 231). Descartes makes the same points to Arnauld on June 4, 1648 (AT 5:193; CSMK 355).

3. *The causal containment notion*. In common notion IV of the *Second Reply* Descartes states: "Whatever reality or perfection there is in a thing is present either formally or eminently in its first and adequate cause" (AT 7:165; CSM 2:116). This axiom or common notion is first introduced in *Meditation* III: "A stone . . . which did not previously exist, cannot begin to exist unless it is produced by something which contains, either formally or eminently everything to be found in the stone" (ibid. 41; 28). The relationship also applies to ideas: "the idea of . . . a stone cannot exist in me unless it is put there by some cause which contains at least as much reality as I conceive to be . . . in the stone" (ibid. 41; 28; see also the letter to Mersenne, December 31, 1640; AT 3:272 CSMK 165).

What the containment notion states is that the effects of a *per se* or principal cause preexist in that cause, are the productive result of its causal efficacy, and derive their character from its nature. It spells out what, for Descartes, is an evident intuition that "we know by the natural

light that a real attribute cannot belong to nothing" (AT 7:161; CSM 2:114). The relation of this common notion to axiom 1 above is made clear in the *Second Reply*: "The fact that 'there is nothing in the effect which was not previously present in the cause, either in a similar or higher form' is a primary notion which is as clear as any we have; it is just the same as the common notion 'Nothing comes from nothing.' For if we admit that there is something in the effect that was not previously present in the cause, we shall also have to admit that this something was produced by nothing. And the reason why nothing cannot be the cause of a thing is simply that such a cause would not contain the same features as are found in the effect" (AT 7:135; CSM 2:97). In short, since *nihil ex nihilo*, whatever is in the effect must have been contained in the cause. In the *Principles*, Part I, article 52, the notion is applied to knowledge of substance: "We . . . easily come to know a substance by one of its attributes, in virtue of the common notion that nothingness possesses no attributes, that is, to say, no properties or qualities" (AT 8.1:25; CSM 1:210). In saying that the cause contains the effect eminently, Descartes means that it contains the entire reality of the effect in a more perfect or higher manner; by formally, he means that the cause and the effect contain the same reality proportionately and with commensurate perfection. Definition IX of the *Second Reply* states that saying "something is *contained in the nature or concept* of a thing . . . is the same as saying that it is true of that thing, or that it can be asserted of it" (AT 7:162; CSM 2:114).

The three causal axioms discussed so far apply not only to ideas but also to their objective content. In Definition IV of the axiomatic section of the *Second Reply*, Descartes says, "Whatever exists in the objects of our ideas in a way which exactly corresponds to our perception of it is said to exist formally in those objects. Something is said to exist eminently in an object when, although it does not exactly correspond to our perception of it, its greatness is such that it can fill the role of that which does so correspond" (AT 7:161; CSM 2:114).

The containment notion, in connection with the perfection axiom, traces it roots to Neoplatonism and Augustine, and was much discussed in the Renaissance. For example, Suárez gives an authoritative account of it in DM 26.1.5, 1:917. There he compares causes and effects with respect to perfection, sufficiency, and duration of action. Of the notion of cause he states: "In the first place it is certain that effects cannot exceed in perfection any causes that simultaneously apply to them. For it is proven that there is no perfection in the effect that is not present in its cause: thus, no perfection can be present in effects that is not preexistent (*praeexistant*) in some way (*in aliqua*) in their cause, either formally or eminently, because causes are not able to give (*dare*) what they do not contain in them-

selves (*se continent*) in any way or degree" (ibid. 917). Eustachius a Santo Paulo gives a similar characterization in his *Summa philosophiae* (First part, treatise II, discourse 2, question 5). But we needn't look to learned metaphysical works in order to find it. In his *Deux verités* (1626), Jean de Silhon, Descartes's friend and correspondent, states: "An effect, to the extent it's an effect, isn't able to have any degree of perfection which the cause has not given it, and which it contains formally or by eminence and in the most noble fashion" (*Primiere verité*, disc. 6). As we will see, it's not clear how the causal containment notion applies to mind-body and body-mind causation, and it certainly doesn't apply to partial, nontotal causes, which, although they contribute to causal outcomes, do not contain everything that comes about in the effect. Moreover, one must note carefully that the containment axiom applies uniquely to God understood as *causa secundum esse*, because the source of existence *per se* cannot be contained in anything but God. Finite causes cannot bestow existence; they can only change states or properties of objects which exist already.

4. *The causal likeness notion*. Causal axioms 1 through 3 imply that there is a "likeness" relationship between cause and effect. Descartes takes this relationship seriously. Indeed, he tells Burman, "It is a common notion and a true one that the effect is like the cause. Now God is the cause of me, and I am an effect of him, so it follows that I am like him." Not only is the causal likeness notion a common notion, but also in regard to God—who is the efficient and total cause, and the "cause of being itself"—anything produced "by this cause must necessarily be like it" (to Burman; AT 5:156; CSMK 340).

According to Descartes, the notion applies paradigmatically to acts of agency in which the *total* cause of an effect is in play. When applied to relationships of horizontal causality, its scope is limited. For instance, there is no causal likeness between the wind and the branches of the tree it moves. Note also that the causal likeness notion is compatible with what we may call the causal dissimilarity principle. Although cause and effect have something in common (usually a genus), the cause differs numerically from the effect. In the next chapter we'll consider whether the likeness notion commits Descartes to exemplar causality and, in connection with this, whether the notion of "eminent containment" carries explanatory force.

5. *The notion that the efficient cause bestows existence*. "We look for the efficient cause of something only in respect of its existence, not in respect of its essence" (AT 7:212; CSM 2:149). This is Arnauld's formulation of efficient causation in the *Fourth Objections*. For him this is the proper conception: "For what is the notion of a cause? The bestowing of existence. And what is the notion of an effect? Receiving existence. The

notion of a cause is essentially prior to the notion of an effect" (ibid. 210; 147). Descartes replies that Arnauld's syllogism can be turned against him. If we "do not ask for an efficient cause with respect to something's essence, we nevertheless ask for an efficient cause with respect to something's existence; but in the case of God, essence is not distinct from existence: hence we can ask for the efficient cause in the case of God" (AT 7:243; CSM 2:243). Thus, if there is in God "no distinction between existence and essence, the formal cause will be strongly analogous to an efficient cause, and hence can be called something close to an efficient cause" (ibid. 243; 169–70). Descartes agrees with Arnauld, with these nuances understood, that we look to the efficient cause as the cause that bestows existence.

6. *The axiom that a genuine cause is copresent with its effect*. This is closely connected to axiom 4. Descartes's position as to whether or not causes can be temporally prior to their effects is unambiguous. "The fact that a cause need not be prior in time is clear from the fact that the notion of a cause is applicable only during the time when it is producing its effect" (AT 7:240; CSM 2:147). He makes the same point in the *First Reply*: "the natural light does not establish that the concept of an efficient cause requires that it be prior in time to its effect. On the contrary, the concept of a cause is, strictly speaking, applicable only for so long as the cause is producing its effect, and so it is not prior to it. However, the light of nature does establish that if anything exists we may always ask why it exists; that is, we may inquire into its efficient cause, or, if it does not have one, we may demand why it does not need one" (AT 7:108; CSM 2:78). Suárez also endorses the view that causes need not be prior to their effects. He asks whether all causes are prior to their effects. He answers by appealing to what he calls "Aristotle's Axiom," namely, that "in act cause and effects act simultaneously" (DM 16. 3.20, 1:925). Thus, a cause in causing must be conceived to be simultaneous with its effect, and since in the very act of causing it produces its effect, it can't be prior in time. For Descartes, God's act of creating/conserving the world paradigmatically fits this axiom; for without the notion that genuine causes are necessarily simultaneous with their effects, being would come from nonbeing. It is clear that Descartes thinks that the essence of cause is understood without relations of temporal priority.

7. *The notion of the causal efficacy of the Creator.* Although he doesn't call it a common notion or an axiom, this notion plays a significant role in Descartes's reasoning about God's causation. In the *Second Reply* he tells us that "this entire universe can be said to be an entity originating in God's thought, that is, an entity created by a single act of the Divine mind" (AT 7:35; CSM 2:97). In saying that the universe is created by "a

single act of the Divine mind," Descartes repeats the view he advanced in 1630 to Mersenne that, in God, willing, understanding and creating are one and the same essential unity. He makes the same claim in his *Principles* and later to Mesland in 1644 (I.23; AT 8.1:14; CSM 1:201; AT 4:113; CSMK 232).

These axioms raise questions concerning how Descartes understands them when applied both to God and to created things. While he doesn't deny that creation is a teleological act, he tells Chanut that "all things were made for His sake: God alone is the final as well as the efficient cause of the universe" (AT 5:54; CSMK 321). This means that since in God understanding, willing, and creating are identical, so too are efficient and final causation, a position Suárez also accepts (DM 23.9.8–9, 1:884). But Descartes denies the necessity of final causation for explaining and understanding physical things. It's sufficient that we inquire into their efficient causes (AT 8.1:16; CSM 1:202). Since, for the later Descartes, physical things are merely *res extensa*, they lack any internal principle of change. Therefore, unlike the natural entities of the Aristotelian tradition, whose ends are inscribed within them, Cartesian *res*, in and of themselves, are not aimed toward an end. Nevertheless, God superintends creation and thereby it is subordinated to the extrinsic ends of divine creation. Thus understood, creation is an expression of God's creative plan (Des Chene 2000, 153–57; Osler 1994; Menn 2000, 122–33). However, as Descartes cautions, "we should not be so arrogant as to suppose that we can share in God's plans" (*Principles* I.28; AT8.1:15–16; CSM 1:202). While we can apprehend that God superintends the acts of creation, we cannot comprehend the details of the divine plan. (See also Gassendi's defense of final causes, AT 7:375; CSM 2:258.) In the section of chapter 3 titled "Epistemic Teleology" we introduce a discussion of the teleological role that sensations play in the preservation of the mind-body union, and also in establishing scientific knowledge of the way things are.

In the Renaissance tradition that informs Descartes, numerous things have outcomes that readily fall under the rubric of final causation. Specifically, it is claimed that in the order of causing, the final cause is prior to the efficient, inasmuch as the latter acts in accordance with an end stipulated by the final cause. Suárez's response is common enough in the period: "Even if the final cause is prior in the order of intention, the efficient cause is nonetheless first in execution. Indeed, it is the efficient cause alone that really has the action (*influxus*)—that is, effects motion *per se* and extrinsically" (DM 26.2.3, 1:920). Descartes agrees with Suárez's view of the explanatory order of the causes. However, Suárez conceives final causation as a quasi-cause (i.e., an auxiliary cause of a cause) whose

causality is coeval with, yet dependent upon, the action of the efficient cause (DM 23.3.5–6, 1:853). Descartes, without qualification, banishes the category of final causation entirely from the physical sphere, though as we shall see, teleology reappears in a dramatic and prominent way.

Some general comments are now in order. For Descartes causal realities are ordered according to levels of perfection, so that causal action either directs itself from a higher to a lower level or is commensurate with the effect it produces. Each of Descartes's axioms reflects this picture, has the status of an innate, common notion, and provides an epistemic map for understanding the world. Within this causal ordering Descartes posits distinctions between "objective," "formal," and "eminent" realities (*esse*), each of which embraces a distinct level of perfection or degree of perfection. Now it is clear that these notions apply to God's action in the world ("vertical causation"). But Descartes also posits causal relations between ideas and corporeal things; between ideas themselves; and between bodies. In what way do we understand that his axioms are consistent with these kinds of causal *relata*, since in each case efficient causal *action* does not strictly apply? For example, axioms 1 and 2, when applied to body-body causation, yield only a causal ordering principle, which invokes in a minimal way, if it invokes them at all, the notions of causal action, perfection, and formal reality.

One way, for example, to understand body-body causation, derived from the Middle Ages, is to construe phrases such as *to be "transferred" from something to something* or *to be "derived" from something*, in a way that is ontically minimal. If the cause is posited, the effect follows; if not, it cannot. On this view, a cause is a *sine quibus non* condition of a change or set of changes (Adams 2007, 66–69). This notion pertains to groups of bodies that interchange within a relational system. From this perspective, each body in the system takes on a "causal role" that it plays out relative to other bodies.[3] A paradigmatic example of this is the circular motion that occurs in a vortex. According to Descartes, all parts of a vortex move simultaneously, or none can move at all. Thus, a part of the vortex moves just in case it simultaneously displaces and is displaced by the other parts such that empty spaces cannot occur. Here we have an instance of Descartes's commitment to the simultaneity of cause and effect in the physical realm and a clear illustration of the *sine quibus non* conception of causal exchanges within a relational system. In chapter 4 we'll see that this picture illuminates Descartes's overall account of secondary or horizontal causation as it pertains to causal outcomes that result when extended bodies encounter one another. We'll also see that the *sine quibus*

[3] We owe this notion of causal role to Francesca DiPoppa.

non conception of causation is not a thinly disguised version of occasionalism. On the contrary, the relationships between bodies at the horizontal level make a difference to the causal outcomes that occur. Moreover, the *sine quibus non* conception specifies what Descartes needs, that is, that the cause acts apart from its effect such that there is no transference from cause to effect.

Chapter Three

SEEING THE IMPLICATIONS OF HIS CAUSAL VIEWS

The Response to His Critics

Descartes's six *Replies* to critics of the *Meditations* were written in a period of three to six months in 1640–41. Given this short period of time we should not expect substantial changes in his thinking over a wide range of issues. However, as we indicated in the first chapter, the view that motion is a transference from one immediate vicinity, which we regard as at rest, into another vicinity first appears in a letter to Mersenne in 1643, and it is not immediately obvious that it maps onto what Descartes says about motion in the *Meditations*. But what we want to stress concerning the character of his *Replies* is that, in constructing them, Descartes becomes more fully aware of what his commitments in the *Meditations* imply. Certainly, he is not above tailoring his responses to suit the vocabulary of his objectors, nor above telling a critic what he wishes to hear, nor of dismissing criticism as worthless, as in the case of Hobbes and Gassendi. Nevertheless, on a number of fronts, the *Replies* take his thinking beyond anything to be found in the *Meditations*. This occurs in regard to his view of God as a causal agent, the essence of whom is power; in the wide scope he gives to the principle that everything has a cause in conjunction with view that God is *causa sui*; his deepened understanding of the implications of positing a transcendent God in whose nature all things are eminently contained; a dawning awareness of what the re-creationism of the *Meditations* means for the natural philosophy he is developing in the *Principles*; and also a deeper insight into the manner in which scientific knowledge is tied to what we call Descartes's epistemic teleology. Thus, we disagree with Martial Guéroult that Descartes's *Meditations* constitute a seamless bloc of certainty arranged so that nothing may be changed without the collapse of the entire edifice (1984, 1:xx). Such claims have forged the now prevalent internalist and nondevelopmental reading of the *Meditations*. Roger Ariew and Donald Cress, Jean-Marie Beyssade, and Jean-Luc Marion (1981, 1995) have stressed, in our view rightly, that Descartes's *Replies* make many additions, corrections, and notable changes to the doctrines expressed in the *Meditations* (Ariew and Cress

2006, xii–xix; Beyssade 1994). The letter to Mersenne of December 31, 1640, and those of the fourth and eighteenth of March 1641, in which Descartes states changes he wants inserted into the *Meditations*, clearly support the claim that the *Objections* make a significant difference to its ultimate content (AT 3:272–76, 320–31, 334–38; CSMK 165–67, 173–77). As Ariew and Cress observe, why would Descartes have bothered with objections if they "had no real possibility of altering the doctrine objected to?" (2006, xiv). It seems clear that Descartes all along intended that the *Objections* and *Replies* would constitute an ongoing dialogue with his contemporaries that, in the give and take, would compliment and develop the monologic arguments of the *Meditations*.

God as *Causa Sui*: The High Tide of Descartes's Causalism

Descartes is deeply committed to the axiom that everything has a cause, and as a result he is led to ask whether God has a cause. In the process of answering Caterus and later objectors, Descartes develops the view that God is self-caused and, in so doing, deepens his understanding of the causal axioms. At the same time he rethinks his conception of God, of how God works in the world, and of how we humans may know the world and God. This results in Descartes forging a new and original view of the dynamic essence of God as power.

An important turn in Descartes's causal reasoning is found in the *First* and *Fourth Replies* (1641). Caterus queries his use of *causa sui* in the second part of the proof for God's existence in *Meditation* III. The passage Caterus quotes states that "if I derive my existence from myself (*a me essem*), then I should neither doubt or want, nor lack anything at all; for thus I should be God" (AT 7:48; CSM 2:33). Caterus asks Descartes to clarify the phrase "from myself." For Caterus, *ens a se* (a thing from itself) can be taken in two senses: positively, meaning "from itself as from a cause," or simply *non ab alia*, that is, "not from another," the negative sense "in which everyone takes the phrase" (ibid. 95; 68). This is the extent of Caterus's query. Descartes, unbidden, brings God squarely into the picture. He says, "I . . . have no hesitation in calling the cause that conserves me an 'efficient' cause. By the same token, although God has always existed, since it is He who in fact conserves Himself, it seems not too inappropriate to call Him 'the cause of Himself' (*sui causa*)" (ibid. 110; 79). This distinction is not employed explicitly in *Meditation* III. Nevertheless, in proving God's existence, Descartes does ask, given the picture of a causal chain, whether any particular cause "derives its existence from itself or from another cause" (ibid. 50; 34). His exchange with

Caterus prompts Descartes to consider the principle that everything has a cause, God included, and to ask in what sense God can be said to be the cause of himself.

Étienne Gilson explains Descartes's use of "from itself" by noting that the notion "everything has a cause" is a principle and therefore "is absolute or it is not a principle. So if everything has a cause, God has a cause. If God hasn't a cause, then it's not possible to say everything has a cause and consequently there is no principle of causality" (1951, 229–30). This is a relevant observation, but it doesn't get to the bottom of Descartes's reasoning. In our view, Caterus awakens in Descartes an awareness of a logic inherent in his position, namely, that if God's act of efficient causing always implies existence, it is necessary to ask whether, and in what sense, God's existence is *causa sui*. This leads Descartes to a nontraditional understanding of the doctrine that God exists *per se* and in virtue of his infinite essence. Tradition holds that God is necessarily infinite and that what is actually infinite doesn't need a cause. Descartes turns this on its head: it's precisely because God is infinite, in the appropriate sense, that he is the cause of himself. Or put more precisely: it's in virtue of the infinite immensity of God's power that he exists. Gilson notes that Descartes's reversal is an important transformation in the history of metaphysics (ibid., 226). It rejects the traditional doctrine that God's existence is anchored in a static essence, in favor of a dynamic notion of divine existence: so Descartes says that when "we attend to the immense and incomprehensible power that is contained within the idea of God, then we will have recognized that this power is so exceedingly great that it is plainly the cause of His continuing existence, and nothing but this can be the cause. And if we say as a result that God derives his existence from Himself, we will not be using that phrase in the negative sense, but in an absolutely positive sense" (AT 7:110; CSM 2:79–80). What's significant about this move, as we will see shortly, is that Descartes *identifies* divine essence and divine power. There seems to be no philosophical precedent for Descartes's reversal, although Suárez, in discussing the distinction between *ens a se* and *ens ab alio*, refers to the church fathers who call God the "origin of Himself" and the "cause of his substance" (DM 28.1.6–7, 2:3). It is not surprising that Marion has argued that Descartes's discussion of *causa sui* is a significant development in the conception of causation (Marion 1994, 305–36).

In the *Second Reply*, the principle of causality is cited first in a list of common notions or axioms: "Concerning every existing thing it is possible to ask what is the cause of its existence. This question may even be asked concerning God, not because He needs any cause or reason to exist, but because the immensity of His nature is the cause or reason why He needs no cause in order to exist" (AT 7:165; CSM 2:118). Notice the

content of Descartes's claim: God needs no cause or reason to exist; nevertheless, it is still a question why the immensity of divine nature explains why God's existence needs no cause. Descartes is positing a *ratio*, namely, he is arguing that the "reason" why God needs no cause (his infinite power) functions as a "cause" of God's existence.

Arnauld's criticism of Descartes in the *Fourth Objections* is based on Caterus's initial query. The nature of efficient causation is central to Arnauld's exchange with Descartes. According to the "strict" formulation espoused by Arnauld, an efficient cause is distinct from its effect, and literally causes, in an antecedently existing thing, the being of an effect. Descartes aptly summarizes Arnauld's objections:

> he explains at length that God is not the efficient cause of Himself, since the notion of an efficient cause requires that it be distinct from its effect. Next he shows that God does not derive His existence from Himself in the "positive" sense, where "positive" is taken to imply the positive action of a cause (*positivum causae influxum*). And then he shows that God does not really conserve Himself, if *conservation* is taken to mean the continual production of a thing. All this I gladly admit. But then he tries to show that God cannot be called the efficient cause of Himself on the grounds that "we look for the efficient cause of something only in respect of its existence, not in respect of its essence." (AT 7:243; CSM 2:169)

What separates Arnauld and Descartes is whether it makes sense to ask why God continues to exist. For Arnauld the question is pointless, because "continuance in existence" is a temporal notion; whereas "in God there is no past or future but only eternally present existence." Thus, in virtue of His essence alone, God is a self-dependent being (*esse a se*) who exists *per se*, "no less than it belongs to the essence of a triangle to have its three sides equal to two right angles" (AT 7:211–13; CSM 2:148–49). Thus, according to Arnauld, in considering whether "God exists, or continues in existence, we should not try to find either in God or outside him any efficient cause, or quasi-efficient cause (I am arguing about the reality, not the name); instead, we should confine our answer to saying that the reason lies in the nature of a supremely perfect being" (ibid.).

Descartes's summary shows that he agrees up to a point with Arnauld, even on his own terms. But at the beginning of his *Fourth Reply*, Descartes makes clear that he understands causation "in another sense," which he takes "to be equally correct" (AT 7:231; CSM 2:162). This other sense first occurs in the *First Reply*. There Descartes states "that God derives His existence from Himself, or has no cause apart from Himself, depends not on nothing but on the real immensity of His power; hence, when we perceive this, we are quite entitled to think that in a sense He stands in

the same relation to Himself as an efficient cause" (AT 7:111; CSM 2:80). In other words, there's a positive sense in which we apprehend, in a way compatible with our understanding—Descartes says, "we are quite entitled to think"—the immense power of God in terms of the notion *efficient cause of himself*.

This characterization draws Arnauld's critical fire; he calls it "a hard saying, and indeed false," claiming that "it is a manifest contradiction that anything should derive its existence positively and as it were causally from itself" (ibid. 208; 146). Descartes dubs Arnauld's objection "my critic's principal complaint," and characterizes it as the "least well-taken of all his objections." He states his reason immediately: "in saying that God 'in a sense' stands in the same relation as an efficient cause, I made it clear that I did not suppose that He is the same as an efficient cause; and in using the phrase 'we are quite entitled to think,' I meant that I was explaining the matter in these terms merely on account of the imperfection of the human intellect" (ibid. 235; 154–55). The reference to the infirmity of the human intellect is important, and one Descartes had already made more forcefully in his reply to Caterus's initial inquiry: "But if they would look at the facts rather than the words, they would readily observe that the negative sense of the phrase 'from itself' comes merely from the imperfection of the human intellect and has no basis in reality" (AT 7:110; CSM 2:79).

The battle is joined. But we need a clearer view of the background and what divides the protagonists. Why does Arnauld so severely denigrate Descartes for conceiving God as the cause of his own existence? The heart of Arnauld's charge is this: "it is absurd to conceive of a thing's receiving existence yet at the same time possessing that existence prior to the time when we conceive that it received it. Yet this is just what would happen if we were to apply the notion of cause and effect to the same thing in respect of itself . . . . The notion of a cause is essentially prior to the notion of an effect" (AT 7:210; CSM 2:147). On this understanding, an efficient cause can't bestow existence unless the cause exists. And if it doesn't exist, it cannot bring something else into existence. This generates a contradictory conception of divine existence: to be the "cause" of his own existence God would have to exist already and, similarly, for God to continue existing, God's prior existence would have to be presupposed (ibid. 210; 147–48). Not surprisingly, then, Arnauld objects to Descartes's claim that God stands "in the same relation to himself as an efficient cause does to its effect."

For Arnauld, God is an infinite being, "indivisible, permanent, and existing all at once, so that the concepts of 'before' and 'after' cannot be applied." Causal reasoning is inappropriate in regard to such a being. God exists timelessly, and "it is pointless to ask why this being should

continue in existence." God is simply an infinite being "whose existence is His essence" (ibid. 211, 213; 148, 150). Arnauld's remarks reflect the theological consensus of the period, namely, that what is infinite in nature needs no cause. This line of reasoning, in regard to causation, is endorsed by the authority of Aquinas in the "Second Way": "nor is it possible that something be efficient cause of itself (*causa efficiens sui ipsius*), because it would be prior to itself, which is impossible" (Aquinas 1964, *Summa Theologiae* 1a, q. 2, art. 3).

But what concept of self-cause does Descartes wish to apply to God, and what are his epistemic reasons for holding this concept? These questions are connected, but consider the concept of self-cause first. In a letter to Mersenne of March 18, 1641, Descartes indicates what he has in mind. He asks that changes be inserted into the yet unpublished text of the *Meditations* and also into the six *Objections* and *Replies*. He wants the *First Reply* changed where it says that there are "those who do not recognize the presence here [e.g., Caterus] of any other type of cause analogous to the efficient." Descartes is clear that he doesn't want the term "efficient" used in the sense in which a cause is prior to its effect. For "when we ask whether anything can be self-dependent (*an aliquid possit esse a se*) the question must not be taken to concern efficient causality strictly so called, or it would be vacuous. . . . It is because of the common scholastic maxim, 'nothing can be its own efficient cause,' that 'self-dependent' has not been taken in the appropriate sense" (AT 3:335; CSMK 175). Therefore, as part of his strategy, Descartes's aim is to establish a causal concept, in the *First* and *Fourth Replies*, which is analogous to an efficient cause, and which captures the positive sense in which something is self-dependent, or is *esse a se*, that is, a "being from itself."

The *Fourth Reply* makes this especially clear, and brings out the logical motivation that lies behind it. Descartes points out that the efficient cause (understood in Arnauld's strict sense) presupposed in the phrase "from itself" must be interpreted negatively, to mean "without a cause." By contrast, for Descartes, "if we accept this interpretation of the phrase 'from itself,' it will be impossible to produce any argument for the existence of God based on His effects, as was correctly shown by the author [Caterus] of the First Set of Objections; and hence this interpretation must be rejected" (AT 7:238–39; CSM 2:166–67). Descartes is pointing out that if we are to argue for the existence of God based on what he creates—the first-cause argument—God needs to be in the causal order, and cannot be treated in a merely negative fashion as "without a cause." But to be in the causal order for us humans means we need to apprehend God from the effects he produces in the world. Thus, "a consideration of efficient causes is the primary and principled way, if not the only way, that we have of proving the existence of God. We cannot develop this proof with

precision unless we grant our minds the freedom to inquire into the efficient causes of all things, even God himself" (AT 7:238; CSM 2:166).

According to Arnauld, God is an autonomous and remote presence who exists apart from the causal order. But Descartes privileges God's efficient causation in an epistemic sense. His strategy is to establish an intelligible ground, a sufficient reason, as it were, according to which God's inexhaustible power as creator can be understood in causal language. Pointing to the duration of our existence as sufficient to demonstrate God's existence, Descartes remarks that "We also understand that He who has so great a power that He can keep us in existence, although we are distinct from Him, must be all the more able to keep Himself in existence" (*Principles* I.21; AT 8.1:23; CSM 1:200). Descartes had argued in the *First Reply* that, since we can discover no power within us sufficient to preserve us "even for one moment of time," our existence must be caused by something other than ourselves. So "the cause arrived at cannot be merely a secondary cause; for a cause which possesses such great power that it can preserve something situated outside itself must, *a fortiori*, preserve itself by its own power, and hence derive its existence from itself" (AT 7:11; CSM 2:80). Accordingly, God is not a remote cause with respect to which created causes are subsumed hierarchically: He is actively copresent with his created effects as they descend immediately into the mind of the meditator in the *Meditations* who thinks the idea of an infinitely powerful God.

Descartes then claims that "it is necessary to show that, in between 'efficient cause' in the strict sense and 'no cause at all,' there is a third possibility, namely, 'the positive essence of a thing' to which the concept of an efficient cause can be extended. In the same way in geometry where the concept of the arc of an indefinitely large circle is customarily extended to the concept of a straight line: or the concept of a rectilinear polygon with an infinite number of sides is extended to that of a circle, I thought I explained that in the best way available to me when I said in this context the meaning of 'efficient cause' must not be restricted to causes which are prior in time to their effects or different from them" (AT 7:239; CSM 2:167).

Descartes agrees with Arnauld that God exists in virtue of his essence. He nevertheless thinks that by conceiving of God as "self-caused," and through the lenses of a "nonstrict" notion of efficient cause, we gain important epistemic advantages, just as we do in geometry when we consider a sphere to be an infinitely sided polyhedron. So if, in one causal concept, we combine features that belong to both the efficient and the formal cause, we will more clearly understand that God's "own essence is the eminent source which bestows on him whatever we can think of as being capable of being bestowed on anything by an efficient cause" (ibid. 241;

168). It is clear that Descartes is attempting to articulate "a concept that is common to both an efficient and a formal cause: that is to say, what derives its existence 'from another' will be taken to derive its existence from that thing as an efficient cause, while what derives its existence 'from itself' will be taken to derive its existence from itself as a formal cause—that is because He has the kind of existence which entails that He does not require an efficient cause" (ibid. 238; 166). But since God's essence and inexhaustible power are identical, the features of both the efficient and formal cause can be adduced as a means to think positively of God as *causa sui*.

In the course of replying to Arnauld, Descartes says: "the immensity of His power or essence (*immensitatem sive essentiae*), in virtue of which He does not need a preserver, is a *positive* thing" (AT 7:237; CSM 2:165). Here Descartes unmistakably identifies God's inexhaustible power with divine essence. As noted, Descartes views God's essence dynamically. God's existence is seen to be a self-caused consequence of his immeasurable power. In 1649, Descartes tells Henry More that God is everywhere in virtue of his power, and that in God "essence and power are not distinct" (AT 5:342; CSMK 372). The consequences are clear: if in God essence and power are identical, the active power that is the cause of divine existence also grounds God's creative activity. Thus, in regard to God, we "are bound to interpret 'from itself' in a causal sense, because of the superabundance of power (*exuperantium potestatis*) which it can easily be demonstrated to exist in God alone" (AT 7:112; CSM 2:80).

The seeds of this dynamic picture of God's essence and power go back to the 1630s, when Mersenne is told that thinking, willing, and creating and conserving constitute one and the same unitary act of divine nature. However, in 1641 Descartes still fails to see fully the consequences of this high tide in his causalism. Spinoza didn't. Indeed, it's no stretch to say that Spinoza's conception of God as *causa sui* comes directly from Descartes. It is embedded, however, in a monist ontology that negates Cartesian transcendence and treats causality in strictly emanative terms. Consequently, for Spinoza everything that is conceived is an emanative consequence of God's infinite power and arises necessarily from it (Spinoza 1966, 41–78).

As we have seen, the period from 1640 to 1641 is seminal in Descartes's thought. He develops "new" directions for the use of the mind, now based on epistemic and metaphysical reasoning, rather than on the abstract methodological procedures of the *Rules*. His aim now is to establish metaphysical concepts that are epistemically reliable and amenable to our cognitive powers. Although our concepts are inadequate, they are epistemically sufficient if what they depict is noncontradictory and possible, and if they satisfy the criterion of clearness and distinctness: "in the case of

the few attributes of God which we do perceive, it is enough that we understand them clearly and distinctly, even though our understanding is in no way adequate" (*Second Reply*; AT 7:152; CSM 2:108). Our concept of God may be inadequate, but we apprehend that necessary existence is contained in it. If we attend with sufficient clarity, "we notice that our idea of God's nature is not self-contradictory" (ibid.). The same is true of the concept of infinitude: "the infinite, *qua* infinite, can in no way be grasped, but it can be understood, in so far as we clearly and distinctly understand that something is such that no limitations can be found in it, and this amounts to understanding clearly that it is infinite" (*First Reply*; AT 7:112; CSM 2:80). This is the framework of thought in terms of which Descartes claims that God is the "cause of himself." God's inner reality is incomprehensible; nevertheless—and this is the purpose of Descartes's hybrid notion of efficient causation—we can grasp that the essence of God contains inexhaustible power.

This line of reasoning is also evident if we ask how God understood as *causa sui* relates to the divine attributes Descartes ascribes to God's essence. In *Meditation* III, he gives two lists that privilege the notion of infinity. For example, the second list states, "By the name 'God' I understand a substance that is infinite (*substantiam quandam infinitam*), independent, supremely intelligent, supremely powerful, and by which I myself and all other things that exist (if anything else there be) are created" (AT 7:45; CSM 2:31). In naming God an infinite substance, however, Descartes goes against weighty theological opinion. For example, Aquinas attributes infinity to God only through his principle definition of God as *actus purus essendi*: God "is Himself His own subsistent being (*ipse est suum esse subsistens*) [and] it is manifest that God Himself is infinite and perfect" (Aquinas 1964, *Summa Theologiae* 1a q. 7, art. 1 corp.). For Aquinas, the ontic determination of God as *actus essendi* takes precedence to calling God substance, since substance can be applied to God only as a substitution for calling God an *esse* that self-subsists. But Descartes posits God's substantial infinitude to be the first determination of God under which other determinations are posited and raised to the highest level of perfection (see Marion 1986a, 306–17).

In this context, substance cannot be understood as what bears properties and accidents. This would threaten to reduce divine being to the ontological footing of finite beings. In many passages, however, Descartes construes substance to be that which is self-sufficient and self-subsistent (AT 7:222, 228; 8.1:24; CSM 2:157, 160; 1:210). His letter to Claude Clerselier, April 23, 1649, is instructive: "by 'infinite substance' I mean a substance which has true and real perfections that are actually infinite and immense. This is not an accident added to the notion of substance, but the very essence of substance taken absolutely and bounded by no defects;

these defects in respect of substance are accidents; but infinity or infinitude is not" (AT 5:355–56; CSMK 377). Here divine substance is *identified* with infinity, so that God as *ens summe perfectum* is subsumed under the actuality of infinitude. Thus, God is the summation of all perfections. But since perfections are carried to infinity, God is the infinitude of all perfections. In the light of this ontology, in understanding God to be *causa sui*, there is no question that our understanding rises to the level of God's inexhaustible power. On the contrary, as we have been arguing, *causa sui* plays an epistemic role that allows the finite mind to bring God's essence and creative power under a causal category amenable to our understanding. In other words, given that God is infinite substance, in him formal and efficient cause are one. Hence, when we apprehend God in terms of the concept of *causa sui*, in a limited way we grasp the immense power of God's essential being. This emphasis on what is knowable to us is one clear aspect of Descartes's dawning epistemic stance. But we should not forget the religiosity that informs Descartes's position. The entire dialectic of the finite and the infinite in *Meditations* III and IV points to the utter subsumption of the self in the infinity of God's boundless power. Not only is the self abject in the face of God's infinite splendor, but its abilities, cognitive and otherwise, are affirmed only to the extent they are realized through the gift of God.

Eminent Containment, Transcendence, Divine Powers, and God's Causal Harmony

This brings us to eminent containment and transcendence and the troubles they bring. Descartes needs to clarify the notion that God "contains" in the highest degree those perfections possessed by created things in an inferior degree. Certainly, the eminent containment doctrine is current in Descartes's philosophical-theological culture, and, as such, it appears uncritically in the *Meditations*. But in the *Second Reply*, under mounting pressure from his critics, Descartes begins to see problems and attempts to deal with them. In Definition IV of the geometrical appendix, as we have noted, he states: "Whatever exists in the objects of our ideas in a way which exactly corresponds to our perception of it is said to exist *formally* in those objects. Something is said to exist *eminently* in an object when, although it does not exactly correspond to our perception of it, its greatness is such that it can fill the role of that which does so correspond" (AT 7:161; CSM 2:114). On this account, eminently contained perfections don't correspond to our perceptions. Take a mundane example: if heat in the kettle is "contained eminently," it will not appear hot to the senses. Nevertheless, properties contained eminently, though impercepti-

ble, can somehow "fill the role" of, or be substitutes for, formally contained properties. But the maneuver scarcely helps. To say eminently contained properties are not in objects in ways corresponding to our perceptions doesn't at all tell *how* they *do* exist in objects. Definition IV shows Descartes's growing concern with the problem of eminent containment. This concern gets developed further in Definition IX of the same *Reply*. There, Descartes claims that to say "something is *contained in the nature or concept* of a thing" is simply to say "what is true of the thing" (ibid. 162; 114). The containment notion, as it appears in the *Meditations*, is an ontic notion and refers to the manner in which something is said to possess its perfections. But Definitions IV and IX allow Descartes to slip into the epistemic mode, a move that often indicates a thinker senses trouble in his position. But once again, the maneuver doesn't seem to help.

Recall a central feature of Descartes's conception of creation. If there's nothing in the effect not previously present, either formally or eminently in its cause, and if God is the continual, total, and efficient cause of everything that exists, it follows that everything created is previously present in God. But how do we understand this? How do we understand that God, an immaterial being, contains eminently, and as its total and efficient cause, what exists in the created world? For, if taken literally, this implies that extension and divisibility are in God. But according to Descartes's reasoning, this generates unacceptable theological consequences. It makes divine nature divisible and liable to change and hence imperfect: and this impugns Descartes's view of God's immutable nature. Hence, eminent containment attempts to negotiate two difficulties. (1) If effects resemble their causes, God must resemble everything he creates. But from this it seems to follow that God is, for example, extended. (2) But if God does not resemble his effects in some suitable respect, there can be no *ratio* that connects cause and effect in the act of creation. This means that for us, creation becomes an utterly incomprehensible act. Does the doctrine of eminent containment succeed in blocking these unwelcome consequences?

Lennon (1998) and Gorham (2003) think that Descartes fails to block them. If we interpret Descartes to mean that God contains the cause of his effects in a manner superior to physical causes, and claim that this can be specified, then Descartes is saying that God doesn't actually possess those properties in any formal sense. This means, of course, that this way of conceiving how God "contains" extension doesn't entail the actual divisibility of God's nature. But according to Lennon, Descartes can't be interpreted this way. In his view, eminent containment means either actual containment or simply reduces to the sheer power to create: but "if actual containment, then we have a kind of pantheism; if sheer power, then we

have a violation of the '*ex nihilo*' principle" (Lennon 1998, 334). The causal likeness principle, that is, axiom 4 above, indicates Descartes's acceptance of the tag that a cause acts to produce something similar to itself. So Lennon's dilemma comes to this: either God actually contains the properties he creates, or He creates them from nothing by sheer power, which violates the containment notion (axiom 3 above) and renders creation unintelligible to us.

Lennon leaves the matter there, but Gorham argues that Descartes's causal axioms presuppose "a realist notion of eminent containment" (2003, 6). In his view, Descartes holds that "causation involves a transference or giving of properties from cause to effect, so that if the cause does not really have the properties of the effect then those properties come from nothing. Hence, the cause of the extended world is also extended" (2003, 4). By casting Descartes's position in "realist" terms, Gorham appears to be supported by the *Second Reply*, where Descartes says that "nothing cannot be the cause of a thing . . . simply because such a cause would not contain the same features as are found in the effect" (AT 7:135; CSM 2:97). This stipulates that the cause must have the same feature it gives to the effect; that is, minimally both must be at the same ontic level of perfection. In the light of this, Gorham claims that Descartes cannot retreat to the view that the cause, as a matter of fact, has the power to bring about features found in the effect. For "simply stipulating that the cause is capable of producing the effect, even though it does not contain the same perfections as the effect, is no better than imagining that the effect comes from nothing" (2003, 8).

Given our discussion of axiom 3, Descartes seems to construe "nothing" in a more robust sense. He says that "nothing," considered as a causal source, cannot by definition contain the same features as are in the effect. But a cause must contain the same features as its effect, whether it contains them formally or eminently (AT 7:167; CSM 2:118). On the face of it, it seems strange to say that *nothing* plays a causal role, even *ex suppositione*. Jonathan Bennett has a suggestive line on this. According to him, we can interpret Descartes as saying that "nothing" is a very diminished something, "too metaphysically feeble to be able to cause anything" (2001, 1:86). But in Gorham's view, it's better to say that "nothing" simply lacks features that it can give to the effect. In other words, to consider "nothing" as a cause is equivalent to saying that it is utterly dissimilar to its effects (2003, 20). However, the interpretive positions of Gorham and Bennett, we will argue, do not address sufficiently Descartes's conception of transcendence.

The eminent containment dilemma is a problem for all theological views that stress God's transcendence in relation to creation. As Gorham points out (2003, 13), Suárez, who accepts the eminent containment

notion, faces the dilemma. Interestingly, Suárez cautions against defining eminent containment in terms of the exercise of causal power: rather it is that which *explains* how it is that God possesses the resources to cause, *secundum esse*, everything that exists. In an interesting passage Suárez writes:

> Not that formally speaking, and in strictness of definition, the power to bring things about is to be identified with containing them eminently: we can make a distinction of reason between these two notions, and we believe that the following causal locution (*causalem locutionem*) is the true way of putting the matter: since it contains the perfections eminently, it follows that it can bring them about (*potest illas efficere*). But we explain this "containing" (*illam continentiam*) by reference to the bringing about of an effect, since this is the clearest and most convenient way we can find to put the matter. (DM 30.1.9, 2:63)

Suárez claims that containment refers to the bringing about of an effect. Now in creating the world, God does bring about an effect *ex nihilo*. He brings about the world from himself (*ex Deo*), and the *ex nihilo* phrase refers to the fact that the effect—the world—does not exist before creation (as we discussed in the second section of the previous chapter). To say that God possesses the features of the world eminently is meant to explain how it is that he has the power to cause such effects even though he does not contain them in the same form in which they come to exist in created beings. This is just a way of emphasizing God's transcendence. This is precisely Descartes's position, and he may well be influenced by Suárez's discussion. So both Suárez and Descartes suggest that eminent containment is best understood in terms of the causal action it underwrites, a notion that is accessible to us cognitively since we can apprehend God's created effects.

Part of the problem is that Lennon and Gorham think Descartes is committed to causal transference. In their view, Descartes's use of the language of "to give" or "to communicate" in speaking of causes and their effects, signals his rejection of causation *ex nihilo*. As Gorham puts the point: "If causation did not require the literal transference of features, but only a certain power, then his objection to *ex nihilo* causation would be simply that *nothing* has no being and hence no power" (2003, 8). So the question is: how literally is the notion that the cause has the "same features" as its effects to be interpreted? Or, to put the point otherwise, is Descartes committed to same-level causation with respect to cause and effect relations at both the "vertical" and "horizontal" levels? We think not.

We argued in chapter 2 that Descartes is opposed to causal transference or transeunt causality. One mistakenly applies this concept to God only if one confuses causation *ex Deo* with causation *ex nihilo*. Consider as a benchmark Descartes's example of causal transference at the "horizontal" level. In *Meditation* III, prior to arguing for God's existence, he gives an account (the first that has come down to us) of causal *relata* between "formal" "objective," and "eminent" *esse*. He states that the idea of a stone's heat cannot be present in his mind unless it is brought about by a cause that has "as much reality as I conceive to be in the heat or in the stone. For although this cause does not transfer (*transfundat*) any of its actual or formal reality to my idea, it should not on that account be supposed that it must be less real" (AT 7:41; CSM 2:28). To be precise, my idea gets its representative content of the stone's heat from a cause that possesses as much actual or formal reality as the idea has "representative" reality. But clearly Descartes denies the presence of any transeunt causal relationship between the idea of the stone, as it is formed in the mind, and the stone itself. The mind's ontic status has a higher perfection than the stone's, so that no direct transference takes place from the stone to the mind's idea of it, the epistemology of which we shall explore in detail in chapters 5 and 6.

Now let's consider in detail the claim that there is no causal transference from God as creator and the world as the created effect. Descartes further elaborates his position on eminent causation and its relation to the causal likeness principle when he discusses being made in God's image and likeness. He says God has placed in him an idea that is, "as it were, the mark of the craftsman stamped on his work" (*Fifth Reply*; AT 7:53; CSM 2 :35). Objecting to this in *Meditation* III, Gassendi takes the metaphor literally, claiming that Descartes presents an "anthropomorphic picture of God" that is on par with saying that the house resembles the builder who builds it (ibid. 306; 213). Descartes disavows Gassendi's charge of anthropomorphism, and denies that he analogizes God's creative act to a craftsman who stamps his mark on an artifact: "the analogy between natural procreation and divine creation is closer than that between artificial production and the divine creation. I did not say, however, that the resemblance between us and God is as close as that between children and parents" (AT 7:373; CSM 2:257). Clearly, Descartes denies a literal interpretation of these analogies and the notion of causal transference they imply. The metaphors of crafting or procreating may be useful heuristics, but they can't capture the inner nature of God's creative act. That act is as inscrutable as God's inexhaustible power is incomprehensible. To Gassendi's charge that it's nonsense to suppose God stamps a mark on his creation, Descartes replies that he's analogizing God's creative act to a manner or style that makes us aware of who stands behind

the work of art (ibid. 373; 256–57). This is borne out in the *Second Reply*: "our understanding tells us that there is in God an absolute immensity, simplicity and unity which embraces all other attributes and has no copy in us, but is, as I've said before, 'like the mark of the craftsman stamped on his work.' In virtue of this we recognize that, of all the individual attributes which, by a defect of our intellect, we assign to God in a piecemeal fashion, corresponding to the way in which we perceive them in ourselves, none belong to God and to ourselves in the same way" (AT 7:137; CSM 2:98). Descartes is replying here to a particular criticism in the *Second Objections* to *Meditation* III, probably from the pen of Mersenne. He is emphasizing again how inferior created beings stand in relation to God's consummate perfections. Thus, it is we who project attributes onto God prompted by the biblical picture that God has made us in his image and likeness. For Descartes, what's essential in this picture is that we think and possess volition and have the ability to bring about effects in the world. This allows us to apprehend something of the nature of God in terms of the effects he has created. In this respect we are closer to God than other created beings. He puts the point in the first person: "God's creation has endowed me with a greater number of attributes, so His image is in me to a greater extent" (AT 5:156; CSMK 340). One of these attributes is our human understanding.

Recall Descartes's statement to Burman: "It is a common axiom and a true one that the effect is similar to the cause" (AT 5:156; CSMK 340). However, according to Descartes's ontology, created *res* (created effects) have different degrees of reality. For example, modes have a lesser degree of reality than the substances on which they depend; and God, the infinite substance, has greater perfection than created substances. Again, mental substance is greater in perfection than extended substance, since the latter is divisible, and "it is self-evident that it is a greater perfection to be undivided than to be divided" (AT 7:138; CSM 2:99). Furthermore, in article 51, Part I of the *Principles*, Descartes argues explicitly that the term "substance" can't be applied univocally to God and to created things (AT 8.1:24; CSM 1:210). The objective content of our ideas also falls under the degree of reality conception. The representative idea of a created substance possesses more objective reality than does the idea of an accident or mode. And the idea of God has more objective reality than that of created substances (*Meditation* III; AT 7:40; CSM 2:28).

These distinctions are a part of a larger picture of the structure of reality according to which it comprises two hierarchies: an order of perfection in things and an order of perfection of ideas. This is set out in *Meditation* III. The order of things has five degrees: nothing, modes, extended substance (finite), thinking substance, God: the order of ideas has five corre-

sponding degrees.[1] This means that the nature of the created world is inscribed with degrees of perfection, allowing us to think and speak, in various ways, of degrees of similarity with respect to our conception of how things stand to God as their creator. For example, Descartes says that even "stones and suchlike" bear a "remote and indistinct" similarity to God, since God is the total cause of their being, and for us they must be understood through the categories of being and substance, but in a radically reduced sense (AT 5:156; CSMK 340). In Descartes's picture, things are what they are in virtue of being the immediate effects of God's creative power. This gives him a basis for speaking epistemically in regard to the different ways in which we conceive things as similar, in varying degrees, to their creator.

It would be a mistake to think that Descartes's picture of the order of things and ideas implies a contrast between the "literal transference" of likeness in the case of creature-creature causation and its absence in the case of God-creature causation. As we've seen, for Descartes, in either case there is no "literal transference." Nor is the term cause "equivocal" when applied to both creatures and to the relation of God and creatures: it has the same meaning in both cases. Of course, how we specify this differs in the case of creatures and God. As we have seen (chapter 2), for creatures the paradigm example of this relation is the heat in the fire which makes water hot. Here the likeness of the effect to the cause falls under the same account or definition, and the effect's occurrence is at the same ontic level, but numerically distinct. However, with respect to God as primary cause, and the world as a created effect of divine causation, the likeness of the effect is understood in terms of an immaterial or intentional *esse* in God as the cause, and again there is no literal transference from cause to effect. It's this picture of divine causation that Descartes probably has in mind when he says that the "entire universe can be said to be an entity originating in God's thought, that is, an entity created by a single act of the Divine mind" (AT 7:135; CSM 2:97). Thus, God, the total and sufficient cause, "thinks" the world into existence, so to speak, and conserves it at each instant. With respect to God this is one unitary act of creation; but for us, existing in time, each instant in which the world is created/conserved anew is separate and independent. This satisfies the axioms to which Descartes commits himself, that is, that God is the total cause of all created effects in which the act of causing, on which those effects depend, is copresent with their existence. To understand God's created effects, we think of them in terms of metaphysical categories, which for us have epistemic validity.

[1] We owe this formulation to an anonymous referee.

Recall that in the geometrical appendix of the *Second Reply* Descartes says the attributes that God "eminently contains" function as transcendent substitutes that "fill in" for what exists formally in the objects of our experience (AT 7:161; CSM 2:114). In other words, Descartes shifts the question into the epistemic mode: "containment" is now characterized as a concept according to which we say what is true of a thing or what can be asserted of it (AT 7:162; CSM 2:114). This move allows us to claim that God possesses those features in a way that is consistent with his immutable nature. Moreover, it allows us to conceive, grasp, and characterize (albeit imperfectly) the perfections in accordance with which the world is brought into being. "Eminent containment," as defined in the *Second Reply* does this (*a*) by privileging the epistemic mode; (*b*) by not reducing God's perfections to God's causal power; (*c*) by articulating a position consistent with the clear and distinct exercise of our cognitive abilities; and (*d*) by satisfying adequately the theological orthodoxy. This maneuver illustrates again Descartes's emerging epistemic stance, which will reach its pinnacle in the *Principles*.

Descartes makes the nature of the epistemic stance clear in a late letter to Henry More: "I consider only what I can conceive, and I take great pains that my judgment should accord with my understanding. And so I boldly assert that God can do everything which I conceive to be possible, but I am not so bold as to deny that He can do whatever conflicts with my understanding." The upshot is this: "our mind is not the measure of reality or of truth; but certainly it should be the measure of what we assert and deny. What is more absurd or more rash than to want to pass judgments on matters which we admit our mind cannot grasp" (February 5, 1649; AT 5:273–74; CSMK 363–74). Many features of reality and of God's transcendent nature are beyond our comprehension. Nevertheless, God has instituted the world such that we can establish, by rigorous philosophical reasoning, clear, distinct, and noncontradictory concepts sufficient to aid our understanding. "Eminent containment" is such a concept, and its role in Descartes's mature causal reasoning is purely epistemic.

This prompts the question: do God's eminently contained perfections exist in the divine mind as *ideas*? Thinking of the divine mind in ideational terms is central to the theological traditions Descartes inherits, especially in the Neoplatonic form in which this sense of the divine mind descended to the seventeenth century. But divine ideas raise the issue of exemplary causation, and whether Descartes accepts some form of it. David and Alan Hausman (1987) answer in the affirmative. Their concern is whether God, a nonextended being, can create an extended world and not violate the *ex nihilo nihil* axiom. They argue that God either contains the *idea* of extension or he creates extended things according to exemplary ideas whose mode of being is, in some sense, independent of God's mode of

being. Ariew (1999, 74) and Gorham (2003, 10) argue, on the other hand, that nothing in Descartes's writings supports the claim that exemplary ideas play a role in his account of divine creation.

We think that Ariew and Gorham overlook an important passage in Part I, article 18 of the *Principles*. They note that the term "archetype" appears in *Meditation* III (AT 7:42; CSM 2:29) and claim, rightly, that it probably refers to formal not eminent containment. But the term is also used in the *Principles* in a theological context. The four articles that precede article 18 discuss the nature and existence of God and the human mind's grasp of them, as do the seven that succeed it. In article 17, the argument for God's existence, based on the objective perfections of an infinite being of which we have an idea, concludes that the perfections exist eminently in that infinite being, since it is "the first and principle cause of that idea." Descartes's reference to God, which he characterizes as the "first and principle cause," clearly occurs in a theological/metaphysical context. Then in article 18 he argues: "we cannot have within us the idea or image [*imaginem*] of anything, of which there does not exist somewhere (either within us or outside us), some original [*Archetypus aliquis*] which truly contains all its perfections. And because we in no way find in ourselves those supreme perfections of which we have the idea, from this fact alone we rightly conclude that they exist . . . in something different from us; that is God" (AT 8.1:12; CSM 1:199).

The most plausible conclusion to draw from this argument is that Descartes's use of the term "archetypus" is a clear reference to God, understood as the *summa* of all perfections, and the cause by which an idea of an infinite being is implanted in our minds. Strictly speaking, Descartes's use of the term commits him to claiming only that the source of the supreme perfections, of which we have an idea, lies in God. But the term *archetypus* carries the meaning of model or paradigm to which something else conforms, in this case our *idea* of God's supreme perfections. In other words, it raises the possibility that Descartes is thinking in terms of exemplary causation. What seems to tell against this is Descartes ontology of divine being. As we've noted, he repeatedly claims that *in God*, willing, understanding, and creating are identically one and the same act and cannot be distinguished even in reason. This is a very stringent view of the indivisible unity of divine being, and it is incompatible with the view that the divine understanding of essences *precedes* God's act of creation. But this distinction needs to be made if *we* are to construe the act of creation as one of exemplary causation, that is, as an act whereby God actualizes eternal ideas in creating the world. Of course, we cannot comprehend God's infinite nature. Nevertheless, if we humans are to *apprehend* God's infinite nature through his attributes, we must—*from our limited perspective*—distinguish God's perfections, especially God's understanding and

God's omnipotence. But how are we to conceive these perfections, of which Descartes says we have an idea as they refer to God? We can think of God's perfections or attributes *per analogiam* with what is conceivable by the human mind. This allows us, *from our limited perspective*, to view our ideas of God's infinite perfections as the result of an act of exemplary causation on the part of God. In this way, the relation of our idea of God's perfections to God's infinite power can be understood according to what is intelligible to us. Clearly, this is consistent with the epistemic stance of the *Principles*.

Connected to the larger issue of "transference" are Descartes's replies to More and Elizabeth, in which he entertains the issue of how a nonextended being "interacts" with physically extended things. He says to More on April 15, 1649: "I do not think that any mode of action belongs univocally to both God and his creatures, but I must confess that the only way I can find in my mind to represent the way in which God or an angel can move matter is the one which shows me the way in which I am conscious that I can move my own body by my own thought" (AT 5:347; CSMK 375). His response to More's claim that immaterial beings have a kind of extension is consistent with this view. "The extension which is attributed to incorporeal things is an extension of power and not of substance." Moreover, "such a power . . . could not be considered to be extended once the extended thing corresponding to it is taken away" (AT 5:269; CSMK 361). Again, he says that to ascribe extension to something is to imagine its corporeal features. But incorporeal substances can't be imagined, and so they cannot "in any strict sense be extended": they are "powers or forces, which although they can act upon extended substances, are not themselves extended" (ibid.). As powers they have intensity, but they cannot have shape or size. Still, for Descartes, considered as an intensive magnitude they can stand in a causal relationship to extended things.

We are now in a position to address the principle of causal harmony we introduced in the first chapter. We have spoken of *sine quibus non* causes, and now that notion must be placed in a larger perspective. It emerges in the Middle Ages as an alternative response to the tag that a cause is that from whose existence another follows (Adams 2007). The standard reading holds that *A causes B* means that B follows from the nature of A *per se*, that is, as its principal cause. The *sine quibus non* interpretation denies this. It claims that *A causes B* means that B follows from A in virtue of the will of something other than A and B. Recall that a principal efficient cause is one that explains, in virtue of its nature, the connection between itself and the effect. For the *sine quibus non* theorist, the connection is not based on the nature of the cause itself; rather, it is based on the will of a separate agent, ultimately God's will. This satisfies

the condition that everything exists and acts under God's ordinary concourse in the sense that if the cause is posited, the effect follows; if not, the effect does not (Adams 2007, 66–69).

We think that Descartes implicitly combines the *sine quibus non* causal notion with the conception of the efficient cause *secundum esse*. Moreover, he links both together with his seven causal axioms to articulate a triadic structure that integrates "vertical" and "horizontal" causation. At the horizontal level we have creature-creature causation understood in terms of *sine quibus non* relations: at the vertical level we have God, the cause *secundum esse* who creates and conserves these relations. Within this framework, Descartes conceives creation as an act of divine harmony continually played out by the exercise of God's efficient causation. At one and the same moment created ideas and created bodies stand in determinate relations one to another, and at the same moment both relate to God as the total and efficient cause. These relationships are doubly asymmetrical: finite minds have higher perfections than bodies, and God's perfections are higher in comparison to both. Both epistemic and causal *relata* are linked together among eminent, formal, and objective *esse*. Thus, we understand that contained in God are the sources of the creative act, namely, the divine ideas or exemplars that God realizes in things and thoughts. For example, finite minds are innately endowed with a capacity to apprehend God's existence, as well as with an ability to grasp in a limited way his essential attributes. Accordingly, finite minds understand the created order through innate ideas that are the immediate effects of divine power. But God creates bodies by willing them to be "natured" things that come into existence according to various sorts or kinds. At the same time the source of bodies, as it exists in the divine mind, is the source of the idea of bodies in the human mind, and, as said, is the creative source of the formal nature of bodies in the created world.

Thus, in virtue of God's harmonious act of continual creation, correspondences exist between the ideas of bodily things in created minds, and the bodily things themselves as they exist external to the mind. In other words, there are *sine quibus non* explanatory relations between bodies and the corresponding ideas in the mind that satisfy the tag "If the cause is posited, the effect follows; if not, it cannot." These correspondences are conserved by God's continual act of creating the world. In each moment, the natures involved have different modes of being: in the divine mind they exist eminently; in finite minds they are present as the objective content of ideas; and in the physical world their mode of being is formal, that is, they define the existence of bodies. Thus, causal harmony is the canopy under which everything exists and acts.

It would be a mistake, however, to view this picture of causal harmony as devoid of teleological content. Certainly, the claim that divine ideas are

the origin of both the forms of things and the forms of thought is efficient-causal. Nevertheless, Descartes's causal harmony principle is a global expression of his belief that the world acts in accordance with divine design, with God's plan for creation, which allows us to understand, from our limited perspective, the workings of creation. Our claim is not that the world is created for human needs, cognitive or otherwise: rather, it emphasizes that the harmony principle captures the "fit" between our created nature and that of the physical world, between the workings of the world and our ability to apprehend it practically and theoretically. This doesn't mean that knowledge is bestowed upon us. On the contrary: it means that we have to achieve it.

Epistemic Teleology

It is clear that God's act of causal harmony has an intrinsic teleological structure. But how does divine teleological play out, and how can we understand it, in the face of Descartes's claim, from the *Meditations* onward, that he eschews teleology? For example, in *Meditation* IV he says, "I consider the customary search for final causes to be totally useless in physics" (AT 7:55; see also *Principles* I.28; AT 8.1:15). What Descartes is avoiding here is Aristotelian and Scholastic final causes conceived to be part of the nature of physical kinds in the world. Descartes also wants to avoid teleology because he wants to bypass theological battles, and in so doing refrains from attributing to humans the ability to understand the ultimate nature of God's aims and purposes (AT 7:55; and *Fifth Reply*, AT 7:373). In this sense, he claims that God's final causes are unknowable and that it would be sheer temerity for us to claim such knowledge. Yet, as we will argue, he is not opposed to a teleology that is used to define the nature of human knowledge. This we will call *epistemic teleology.*

Despite Descartes's disclaimers about final causes, teleological talk runs rampant throughout his philosophy, as Peter Machamer has shown (1976). Machamer notes the presence of a global teleology at work in Descartes's account of the material world that gives content to his conception of the world's causal harmony: "Descartes does not, and cannot, rule out that we were created by God in such a fashion that we are able to learn about the world. So while it is not true that God created the world as it is for our sake, it is true that we are the way we are (capable of knowledge) because he created us and the world according to a certain design. . . . If we are to have certain knowledge of the essence of things in the world, then the world must have been created by God in such a fashion that its essences "fit" with our modes of perception and cognition" (1976, 191). To illustrate his interpretation, Machamer shows (1)

that in the *Principles*, intentionality, the language of purpose, and the taking of a cognitive stance play irreducible roles in the way Descartes establishes his conception of motion and its laws in the context of body-body causation, and (2) argues that in *Meditation* VI, Descartes first advances a genuinely teleological conception of the role of the senses, such that the "sensations or qualities we perceive are there because of their usefulness to the perceiving system," and in order to aid in the preservation of the mind-body union (1976, 189–95). In other words, Descartes portrays sensations in genuinely teleological terms, as being indispensable for ensuring survival and orienting us in the world, without contradicting explanations of them in terms of efficient causes. Thus, sensations fall under two kinds of explanations: one in terms of efficient causes and another in terms of function and end. It is no part of Machamer's analysis to claim a role for final causes in Descartes's thought as substitutes for efficient causes. Nevertheless, this is not incompatible with the fact that an irreducible teleological dimension is present in Descartes's account of how the senses and scientific cognition function in the human mind-body union.

Machamer's account of the role that sensations play for Descartes in providing the representational content for making judgments about navigating in the world and for preserving the mind-body union has not been much commented upon in the literature. More recently, Alison Simmons has broached this theme, and provides an elaborate argument as to how Descartes uses teleology in his account of sensations. She shows nicely that any Cartesian commentator has to take seriously Descartes's claim—which first appears in *Meditation* VI—that human beings have sensations for the purpose of preserving the mind-body union. Simmons rightly notes that Descartes's conception of the body "is already teleological: that the body is only in 'good working order' or 'well-arranged' or 'defective' relative to the end of providing a suitable home for the mind." Moreover, she points out that "the mind needs to know not simply how things stand in the corporeal world, but how they stand *relative to its body* and especially *relative to its body's continued fitness*" (2001, 55). Simmons notes that Descartes is not simply describing the dispositional regularities in accordance with which the senses operate. Her point, rather, is that the senses sometimes malfunction and err insofar as the sensory system prompts us toward things not beneficial to our well-being (AT 7:84; CSM 2:38). But to conceive the role of the senses in this manner is to conceive them normatively and not merely descriptively. What malfunctions or errs does so when it fails to do what it is supposed to do, not simply when it "fails to do what it *usually* does" (2001, 57).

We shall elaborate Descartes's position on epistemic teleology to show how it works in his natural philosophy, both in regard to the acquisition

of human knowledge and in regard to what it is that humans know about the material world. One of our central aims is to show that for Descartes, teleology is essential not only for understanding the practical role that the senses play, but crucial also for establishing *scientific* or theoretical knowledge of the material world as it is brought before the mind by the senses. It is this epistemic dimension in Descartes's teleology that constitutes the implementation of the causal harmony principle, and gives content to the emergence of the epistemic stance in his post-*Meditations* thought. Ultimately God's harmonious act of creation and re-creation is reflected in Descartes's new doctrine of the teleological nature of human sensory knowledge. His move toward this teleological form of the epistemic stance first appears in *Meditation* VI. It will become clear, as we look in detail at this move, that it sets limits to what human beings can know about the world, since knowledge is tied both to the practical aim of survival and to the theoretical aim of understanding the world to the extent it is disclosed through experience.

Descartes begins his argument by discussing what nature teaches him about his sensations. He starts with sensations that refer to his own body:

> There is nothing that my own nature teaches me more vividly (*natura magis expresse doceat*) than that I have a body, and that when I feel a pain there is something wrong with the body, and that when I am hungry or thirsty the body needs food and drink, and so on. . . . Nature also teaches me (*Doceat etiam natura*), 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 ship, but that I am very closely joined, and as it were intermingled with it, so that I and the body form a unit. If this were not so, I, who am nothing but a thinking thing, would not feel the pain when the body was hurt, but would perceive the damage purely by the intellect, just as a sailor perceives by sight if anything in his ship is broken. . . . For these sensations of hunger, thirst, pain and so on are nothing but confused modes of thinking that arise from the union and, as it were, intermingling (*permixtione*) of the mind with the body. (AT 7:80–81; CSM 2:56)

He now moves on to other sensations or perceptions, involving other bodies:

> I am also taught by nature (*doceor a naturâ*) that various other bodies exist in the vicinity of my body, and that some of these are to be sought out and some avoided (*prosequenda sunt, alia fugienda*). And from the fact that I perceive by my senses a great variety of colors, sounds, smells and tastes, as well as differences in heat, hardness, and the like, I am correct in inferring that the bodies which are the

> source of these various sensory perceptions possess differences corresponding to them, though not perhaps resembling them. Also the fact that some of the perceptions are agreeable to me and others are disagreeable makes it quite certain that my whole body, or rather my whole self, in so far as I am a combination of body and mind, can be affected by the various beneficial or harmful (*commodis & incommodis*) bodies which surround it. (AT 7:81; CSM 1:56)

Two points are of note here. First, the correctness of what nature teaches him regarding the sources of sensory perception depends on the fact that what he perceives corresponds to differences in the objects, despite the fact that what is perceived does not necessarily resemble what is in the objects. Second, he remarks that some of these perceptions are agreeable or disagreeable, which makes it certain that his body can be affected by beneficial or harmful bodies external to himself.

But all is not so easy. He realizes that he may, and sometimes does, make mistakes, and so he elaborates on some of the kinds of mistakes that are possible, which are examples of judgments that we make that have no basis in nature. Thus, the mistakes enumerated are all judgments culminating in beliefs about how the objects causing the sensations resemble (in some sense) the sensations:

> There are, however, many other things which I may appear to have been taught by nature, but which in reality I acquired not from nature but from a habit of making ill-considered judgments (*inconsiderate judicandi*); and it is therefore quite possible that these are false. Cases in point are the belief that any space in which nothing is occurring to stimulate my senses must be empty; or that the heat in a body is something exactly resembling the idea of heat which is in me; or that when a body is white or green, the selfsame whiteness or greenness which I perceive through my senses is present in the body . . . or, finally, that stars and towers and other distant bodies have the same size and shape which they present to my senses. (AT 7:82; CSM 1:56–57)

He now needs to look more closely at what it means to be taught by nature. And he is quite careful to limit the scope of his inquiry to bodily based sensations, excluding both perceptions or knowledge that comes from the mind alone and knowledge that relates solely to body.

> But to make sure that my perceptions in this matter are sufficiently distinct, I must more accurately define what I mean when I say that I am taught something by nature. . . . In this context I am taking nature to be something more limited than the totality of things bestowed upon me by God. For this includes many things that belong

> to the mind alone—for example my perception that what is done cannot be undone, and all other things known by the natural light; but at this stage I am not speaking of these matters. It also includes much that relates to body alone, like the tendency to move in a downward direction, and so on; but I am not speaking of these matters either. (AT 7:82; CSM 1:57)

We will have to examine later how knowledge about body arises, but at this point in the *Meditations* Descartes has only established (as we have seen) that bodies external to him exist and are the causes of his sensation (by virtue of their active powers, which he still believes in at this time). Getting more to the point, he writes:

> My sole concern here is what God has bestowed on me (*mihi a Deo tributa sunt*) as a combination of mind and body. My nature then, in this limited sense, does indeed teach me to avoid what induces in me a feeling of pain (*doloris*) and seek out what induces feelings of pleasure (*voluptatis*), and so on. But it does not appear to teach us to draw any conclusions from these sensory perceptions about things located outside of us without waiting until the intellect has examined the matter. For knowledge of the truth of such things seems to belong to the mind alone, not the combination of mind and body. (AT 6:82–83; CSM 1:57)

So the mind must sort out what is true of the bodies that cause sensations within us. We have to use the mind to determine what properties bodies have. In fact, we have to provide arguments and develop theories about the natures of bodies in order to correct any mistaken judgments about bodies that have been "made since childhood onwards without any rational basis" (AT 7:83; CSM 1:57). So for example, "there is no convincing argument for supposing that there is something in the fire that resembles the heat. . . . There is simply reason to suppose that there is something in the fire whatever it may eventually turn out to be, which produces in us feelings of heat or pain" (AT 7:83; CSM 1:57). In order for humans to correct such judgments, they need to determine, as best they are able, what is the correct "order of nature." So he concludes, regarding all sensations or perceptions arising from the body to the mind:

> For the proper purpose of sensory perceptions given me by nature is simply to inform the mind of what is beneficial or harmful for the composite of which the mind is a part (*quia nempe sensuum perceptionibus, quae proprie tantum a natura datae sunt ad menti significandum quaenam composito*); and to this extent they are clear and distinct. (AT 7:83; CSM 1:57)

This is a very strong teleological position. It means that the only knowledge we can derive from sensation or perception is goal directed. Sensations or perceptions provide information *for* the body-mind composite *about* what is beneficial or harmful to that union. The knowledge, then, that God grants us via sensation is limited to this end. God's institution of this teleological system of sensation is obviously part of the harmony by which he creates in the world, and part of the "order of nature" that he establishes so that we may come to have knowledge, albeit limited. Of course, Descartes continues, we must be careful when making judgments about what is the case: "It is not unusual for us to go wrong even in cases where nature does urge us towards something" (AT 7:84; CSM 1:58). I may feel my "throat to be dry when drinking is not beneficial to [my] continued health" (AT 7:85; CSM 1:58–59). But even in such cases God is not a deceiver, for he has given us the ability to learn medicine or physiology by which we may correct such mistaken urges to bad judgments. But the system of human sensation production (and we'll have much more to say about this in chapter 6) is optimal for producing the knowledge that humans need (as opposed to all the knowledge to which God might have given them access):

> My final observation is that any given movement occurring in the part of the brain that immediately affects the mind produces just one corresponding sensation; and hence the best system that could be devised (*nihil haec in re melius posse excogitari*) is that it should produce one sensation which, of all possible sensations, is most especially and most frequently conducive to the conservation (*conservationem*) of the healthy man. And experience shows that the sensations which nature has given us are of this kind; and so there is nothing to be found in them that does not bear witness to the power and goodness of God (*ac proinde nihil plane in iis reperiri, quod non Deo potentiam bonitatemque testetur*). (AT 7:87; CSM 1:60)

It is remarkable, given claims in the secondary literature about Descartes's avoidance of teleological explanation, the extent to which he emphasizes God's role in establishing this teleological arrangement, and how it is to our benefit. He further elaborates this theme of the "immense goodness of God," even though God misleads us from time to time. Descartes argues again that the system is the most reliable that could have been devised, given that we are able to notice errors and correct or avoid them without difficulty (AT 7:89; CSM 1:61). This human ability to use the senses (plural), memory, and intellect to make corrections and devise coherent theories is what allows Descartes, in the final page of the *Meditations*, to dispel doubt concerning the senses, and to tell the difference between dreaming and waking life. That this teleological reliabilism

should provide the answer to his meditative doubts surely underscores the importance of this doctrine, and makes an unassailable case that God's harmonious creation and re-creation of the world allows for human knowledge, but only of a very limited kind. It is this teleology that first arises in the *Meditations* that makes very clear the fundamental move in Descartes's turn to the epistemic stance.

Descartes does not give up this teleological position on human knowledge. In fact, it grows in importance as he develops his later philosophy. What is most interesting, however, is that none of the objectors to his *Meditations* comments on this teleological move, even though it is the dénouement of the Descartes's antidoubt argument. He repeats this teleological claim later in the *Principles* (II.3). Here the argument is much less elaborate, but it still clearly applies to all sensation. The article's title and content read:

> *That the perception of our senses does not teach us what really exists in things, but only what can harm or benefit that union.*
>
> It will suffice for us to notice that the perceptions of our senses pertain (*referri*) only to this union (*conjunctionem*) of a human body with a mind [in II.2 he gave the reasons why we know the human body is united to the mind], and, that, even though they ordinarily (*ordinarie*) show (*exhibere*) us how external bodies can be beneficial or harmful to this union (*quid ad illam externa corpora prodesse possint aut nocere*), they do not, however (except occasionally and accidentally), teach us what these things are like in themselves (*nos docere, qualia in seipsis existant*). We shall easily thereby lay aside those prejudices which arise [solely] from our senses, and shall use here only our understanding; by carefully considering (*diligenter attendente*) those ideas with which nature endowed it, {and which are like the seeds of those truths which we are capable of knowing}. (AT 8.1:41–42; M 40)

Descartes's point once more is that humans should not be led by their inclinations to accept the semblances of the senses, but rather should use their reason rightly to correct their views about what sensations teach. But the moral is still that sensations don't teach us what things are in themselves, but only how external bodies are beneficial or harmful to the mind-body union.

In 1645, Descartes, when writing to Princess Elizabeth, continues to affirm the teleology of knowledge with respect to what is useful to us:

> In order to be disposed to judge well, only two things seem to me necessary. One is the knowledge of the truth; the other is practice in remembering and assenting to this knowledge whenever the occasion

> demands. But because nobody except God knows everything perfectly, we have to content ourselves with knowing the truths most useful to us. (Letter to Elizabeth, September 15, 1645; AT 4:291; CSMK 265)

In this same letter, he enumerates the kinds of truths that we need to know. The third is science, which expresses the position he had first outlined in the *Meditations*: (1) "There is God on whom all things depend, whose perfections are infinite"; (2) "the nature of our soul, insofar as it subsists without the body, is much nobler than the body"; (3) "It may be useful to judge worthily of the works of God and to have a vast idea of the extent of the universe, such as I have tried to convey in the third book of my *Principles*"; and (4) "None of us [even as distinct persons] could subsist alone, and each one of us is really one of many parts of the universe, and more particularly part of the earth, the state, the society and the family" (ibid. 291, 292, 293; CSMK 265, 266).

He makes the view that science is useful even clearer in the preface to the French translation of the *Principles* (1647) in discussing the structure of the "tree" of knowledge. Metaphysics, he says, is fundamental: "The second part is physics, where after discovering the true principles of material things, we examine the general composition of the entire universe . . . next we need to examine individually the nature of plants, of animals and, above all, of man so that we maybe capable later on of discovering the other sciences which are beneficial to man" (AT 9.2:14; CSM 1:186). Descartes repeats this teleological claim in a 1649 letter in which he tells Henry More why he disagrees with Epicurus, Democritus, and Lucretius, who, he says, believe there is nothing in the world besides what the senses show us, which is a view that we all held when we were children. So he says: "As I warned in article 3 of Part Two [of the *Principles*], our senses do not always show us external bodies as they are, but only in so far as they are related to us and can benefit or harm us" (letter to More, February 5, 1649; AT 5:271; CSMK 362).

In his last work, *The Passions of the Soul* (1649), Descartes is again overtly teleological, but here his concentration is on the passions rather than sensations in general. He starts by repeating a claim he has made even in his very early work, namely, that he has a practical, as opposed to a theoretical, philosophy. But now the practicality is played out by practicing science. He writes about the passions as a *physicienne* and makes the claim that "there is an infinity of things to find out in Physics which can be extremely useful to life" (AT 11:308; V 6). But in the *Passions* he limits his discussion of sensations to those that excite the passions. Of course there are also sensations that serve our knowledge in other ways, as well as sensations to which we are indifferent:

> I note that objects which move the senses do not excite different passions in us in proportion to all of their diversities, but only in proportion to the different ways they can profit or harm us, or generally, be important to us (*seulement à raison des diverses façons qu'ils nous peuvent nuire ou profiter, ou bien en general ester importans*); and the use (*usage*) of the passions consist in this alone: they dispose the soul to will (*disposent l'âme à vouloir*) the things that nature tells us are useful (*les choses que nature dicte nous ester utiles*) and to persist in this volition, just as the same agitation of spirits that usually causes them disposes the body to movements conducive to the execution of those things. (AT 11:372; M 51)

So he says that he will enumerate the passions according to the ways they are different with respect to our senses, and are important for us because the senses tell us how they can be moved by the objects causing them. That the passions are moved to incorporate the object as part of us is important (while this is not the case for all sensations):

> We may distinguish two kinds of movement produced in the gland by the spirits. Movements of the first kind represent to the soul the objects which stimulate the senses, or the impressions occurring in the brain; these have no influence on the will. Movements of the second kind, which do have influence on the will, cause the passions or bodily movements which accompany the passions. (*Passions* I, art. 47; AT 11:365; CSM 1:346)

Descartes here concentrates only on the will insofar as it causes bodily movements, not on the will as involved in judging. For he has maintained throughout his career that sensations representing objects can cause the will to form erroneous judgments if it (the will) is not held in check by reason. So the passions are special cases of global teleology:

> their natural function (*leur usage naturel*) is to move the soul to consent and contribute to actions which may serve to preserve the body or render it in some way more perfect (*inciter l'âme à consentir & contribuer aux actions qui peuvent servir a conserver le corps, ou a le render en quelque façon plus parfait*). (*Passions* II, art. 137; AT 11:430; CSM 1:376)

The next chapter will examine body-body causation in the *Principles* and show how epistemic teleology functions in establishing Descartes's conception of motion and its laws.

Chapter Four

BODY-BODY CAUSATION AND THE CARTESIAN WORLD OF MATTER

We turn now to the vexed problem of horizontal causation in Descartes's theory of the material world, that is, his account of body-body causation. The second chapter established Descartes's view that God is the universal and total efficient cause of all that can happen such that nothing can happen without his willing it. We also saw that Descartes adheres to the view that God's willing, understanding, and creating are one and the same thing. Thus, to say nothing can happen without God's willing it is just to say that nothing can happen without God's producing it. But if God creates, causes and conserves everything, what role is left for created things conceived as causes? In short, how can there be genuine causal efficacy in the created world? This problem also arises from the fact that Descartes in his later work redefines matter as nothing but extended substance, thus depriving it of intrinsic force, power, or causal efficacy in its own right. So it appears from the perspective of both vertical and horizontal causation that nothing can happen in the material world without God producing it.

So far our approach has been to chart the development of Descartes's views. With regard to body-body causation, we have already noted some significant differences between *The World*, the *Meditations*, and the *Principles* in how Descartes understands God's causal action in the world. More precisely, we have shown that the axiom of the independence of the parts of time emerges in *Meditation* III as a consequence of Descartes's reflection on the nature of his disembodied existence and the realization that he cannot be self-caused. This analysis establishes that God, the *causa secundum esse*, acts simultaneously with the effects he produces. As shown in what follows, this shift in his understanding of how God stands causally to the material world has significant implications for Descartes's post-*Meditations* views on body-body causation.

The Current Debate on Body-Body Causation

It is important to begin our developmental account of Descartes's views on body-body causation by situating ourselves within the ongoing schol-

arly debate. In recent years, there is no topic that has received more critical attention from Cartesian scholars and generated such irreconcilable divisions. Reduced to its essentials, the question is this: in horizontal causation, do Cartesian bodies genuinely cause changes in other bodies? This question is prompted by Descartes's sparse ontology of material substance in his post-*Meditation* period. In chapter 1, we showed that in the *Meditations* (1641) Descartes still holds the view that matter possesses active powers as part of its nature. By the time of *Principles* (1644), he states categorically that "extension in length, breadth and depth constitutes the nature of corporeal substance. . . . Everything else which can be attributed to body presupposes extension, and is merely a mode of an extended thing" (Part I, art. 53; AT 8.1:25; CSM 1:210). A given body's strict and proper modes are its ways of being extended and are the only variations that follow from its nature. This stark, minimalist ontology denies that color, weight, and tactile properties are essential to the nature of body (AT 8.1:42; CSM 1:224).

But does this ontology rule out the possibility that bodies, considered in themselves, are genuine sources of change? The question is pressing. If bodies just are extensions, whose proper modes are size, shape, and position, they cannot then possess, as part of their nature, any intrinsic source of change. In other words, it follows immediately from Descartes's new definition of body that bodies lack efficacy in their own right.

Does this mean that the material world is devoid of agency and patiency? This question is tied to the larger framework of thought we introduced in the chapter 2. God is essential being, who creates and conserves all the things that are. Thus, from the vertical perspective, God's act of creating and the fact that things come into existence are coextensive notions. This metaphysical and theological framework grounds Descartes's commitment to three interrelated notions: that genuine causes necessarily occur simultaneously with their effects; that causing takes place just when the cause is acting; and that God is the efficient, total, and continual cause of everything that exists and every effect that occurs. So given Descartes's re-creationism, from the vertical perspective bodies are nothing without God's continual creation. But, as we've noted, this raises the question whether they have some manner of independent being and may be regarded as causes in their own right.

There are three traditional responses to this question. It can be argued that although God is the source for the existence of bodies, he cooperates with operations grounded in their nature: to use Scholastic jargon, he *concurs* or coproduces their effects. On this view, every bodily effect is the result of a single cooperative act between God and existing bodies, an act in which God and bodies are both *per se* and immediate causes of the very same effect at the very same time. Given Descartes's view that bodies

lack causal efficacy in their own right, it is not immediately clear that concurrentism fits his picture of the material world. Suárez and Fonseca are notable Renaissance proponents of this view. At the opposite end of spectrum is Durandus, a fourteenth-century Dominican, who argues for conservationism. This view holds that God contributes to the actions of created things solely by creating them and conserving them along with their active causal powers (Freddoso 2002, cii–ciii). On this account, created things can and do cause their effects but without any immediate input from God. Thus, when a body produces an effect, it alone is the *per se* and immediate cause of that effect, and God is simply a remote cause of the effect by virtue of conserving the body's existence. Again, it's not clear that this fits Descartes's position, although Tad Schmaltz (2008, 116–21) has recently argued that it does so because of Descartes's views on the duration of bodies. Apart from concurrentist and conservationist readings of Descartes, occasionalist or quasi-occasionalist interpretations are prevalent in the literature. On the occasionalist view of body-body causation, God is the cause of both the existence and the causal effects of bodies, given that bodies, in virtue of their nature, lack any form of genuine causal efficacy. On the occasionalist view, God is the only real cause acting in the world of bodies, and bodies are the mere occasions for triggering God's causal action. According to the view we will articulate, Descartes's position on body-body causation fails to fit any of these positions in any unproblematic way.

Yet any interpretation of Descartes's position on body-body causation has to contend with the fact that he is quite happy to talk as though the material world is populated by bodies that possess forces able to exert causal influence upon one another. This led some seventeenth-century Cartesians to treat bodies as genuine secondary causes. Others, who took his metaphysics of bodies seriously, interpreted him as an occasionalist, thereby downgrading bodies to mere occasions for the exercise of divine causation. On the face of it, the occasionalist solution fails to satisfy Descartes's commitment to producing a viable, self-standing physics of the world. On the other hand, the attribution of real secondary causes to bodies preserves this commitment, but it seriously compromises his later metaphysics of the nature and motion of created bodies.

Recent debates on the causality of Cartesian bodies turn on whether their nature is exhausted for Descartes by purely geometrical features, or whether he accepts an expanded conception of their ontology, according to which they possess some sort of force or power, and thereby are constituted as genuine causes of motion. Supporters of the first position include Gary Hatfield (1979), Daniel Garber (1992) and Geoffrey Gorham (2004). The second position includes Michel Guéroult (1980), Alan Gabbey (1980), Desmond Clarke (1996), Michael Della Rocca (1999), and

Tad Schmaltz (2008). Broadly speaking, the first group holds that the activity present in the material world is due immediately to divine action and that force or powers can't be genuine modes of bodies since they can't be reduced to the principal attribute of bodies, namely, extension. The second group agrees that powers or forces are not genuine modes of extended bodies in the strict sense, but argues that the actual properties of bodies do not in every case count as modes in that strict sense. They point out that created extended bodies *endure* through time. So while the duration of an extended body is not a mode of its bare extension, it is nevertheless a way of being for that extended body, namely, as an entity that actually exists through time. Guéroult (1980, 80) attempts to interpret Cartesian metaphysics to show that forces can be derived from the attributes of existence and duration that extended substances have simply in virtue of being substances. Gabbey (1980, 235–38) adds to this interpretation the idea that God, considered as the *causa secundum esse*, is the cause of substantive changes, whereas bodies in virtue of being *causas secundum fieri* are the causes of their modal changes. Certainly, we agree that created extended bodies fall under common attributes such as duration and existence. In our view, however, problems arise for the second group to the extent they link force (each in different and complicated ways) with duration and existence to argue that Cartesian bodies thereby possess genuine force in virtue of being enduring extended bodies. Whereas Gabbey never says how a passive *res extensa* can possess an intrinsic mode able to produce these changes, Clarke (1996) attempts to remedy this by introducing a special kind of mode into Descartes's ontology. Needless to say, this comes at the expense of seriously amending his metaphysics.

A third interpretative approach attempts to show that Descartes accepts some form of concurrentism. Dennis Des Chene (1996, 330–41), Michael Della Rocca (1999), and Andrew Pessin (2004) have put forth versions of this position. According to their reading, bodies are genuine causes, but not causes understood in the sense of Scholastic Aristotelian causes. It is Helen Hattab (2007), however, who has made the most ambitious attempt to provide a concurrentist reading of Descartes that preserves the causality of secondary efficient causes together with their dependence on divine power. Hattab argues that Descartes's view of material efficient causation lies between the extremes of occasionalism and mere conservationism (the view that secondary causes act independently once created and conserved by the first cause). She reads Descartes as adopting "the Jesuit solution which holds that God and the secondary cause produce the effect by the very same action—only Descartes substitutes the laws of nature for the individual substantial forms that do the work of specifying God's indifferent and universal action on the Jesuit view" (Hattab 2007, 53).

In the light of the above readings, there are a number of questions to be asked. Is the tendency that Descartes attributes to bodies a real tendency? If it is, it is a "property" that bodies possess over and above the fact that they are geometrically extended, since a merely extended body cannot, as such, be said to possess such a tendency to act. On what grounds can this property be ascribed to bodies? According to Della Rocca's version of Cartesian concurrentism, bodies possess actual tendencies in virtue of the relations in which they stand to God. After all, they are caused by God and set into motion or rest by God. So God and his immutability see to it that "a certain purely geometrical object maintains its current state of motion or rest unless it encounters a certain other body" (1999, 60). Thus, for Della Rocca, bodily tendency is not simply grounded in the character of the body insofar as it is a purely geometrical object, but also "and crucially in its relations to God" (60). At this point, those who interpret Descartes as an occasionalist part company. Hatfield and Garber, for example, don't deny that bodies stand in various relations to God. But in their view, bodily tendencies, to the extent they are grounded in divine immutability, cannot be genuine forces in bodies (Hatfield 1979; Garber 1992, 297–98). For Della Rocca (1999, 61) and Pessin (2004): on the other hand, bodies are genuine causes simply because they possess a real but momentary tendency to maintain their states of motion or rest. Guéroult, Gabbey, and Schmaltz, in their individual ways, draw a stronger conclusion. For them, God's causal activity grounds these tendencies. Nevertheless, in their view, Descartes is a strong conservationist in the sense that forces persist over time in Cartesian bodies and are able to act independently of God once they are created with bodies.

We will argue that tendencies ascribed to bodies in order to preserve their states, though grounded in God's causal action, function in Descartes's thought as epistemic requirements necessary for having an intelligible physics. This way of construing constraints on what we may know is a crucial part of Descartes's epistemic stance. Moreover, in our view, there are no textual grounds in the *Principles*, nor is there a clear motivation on Descartes's part, for making an *ontological* identification of these tendencies with forces or powers present inherently in bodies because of their endurance through time. On our account, God acts in the world to keep bodies moving or resting in such a way that, from our epistemic perspective, bodies can be described *as if* they possess a force either to continue moving or a force for remaining at rest. Thus, the position we'll argue for agrees in large measure with Garber and Gorham that forces, as entities persisting over time in bodies, are nowhere to be found in Descartes's material world (Garber 1992, 293–99; Gorham 2004, 390–91). Nevertheless, we'll also argue that bodies do what they do simply in virtue of how their created natures make knowledge possible. And as we saw at

the end of the last chapter, this knowledge is possible only in virtue of God's causal harmony and the epistemic teleology it grounds. We couldn't have the knowledge we have of the world unless bodies were the way they are; but what we know of them need not depend on their ultimate metaphysical nature, but rather on the roles that we can discern by which they operate in the harmonious system of God's creation.

The principal aim of this chapter, then, is to show how Descartes arrives at his mature view of body-body causation. Descartes's position changes over time, and his final account of material causation is significantly different from what he presents in *The World*. What conflicting interpretations of Descartes's views largely fail to do is to take the development of his thought on this issue seriously. Moreover, apart from Gorham's recent work (2004) on Cartesian causation, they fail to see the true metaphysical significance of the doctrine that the parts of time are mutually independent. If we are right regarding our claim that the doctrine of re-creationism first emerges in *Meditation* III, then in large part this is reason why Descartes changes his view on secondary efficient causation in the *Principles*. If God conserves the existence of material substances by re-creating them successively in independent moments of time, by the same action he re-creates their natures independently of each of the prior moments in which they have already existed. Moreover, if, as Descartes holds, there is only a modal distinction between the particular modes of bodies and their principal attribute (*Principles* I.61; AT 8.1:29; CSM 1:213), God's act of re-creating them, together with their principal attribute, determines all their modes independently of all prior moments in which they exist. In other words, as we argue in the second chapter, the mutual independence of the parts of time is for Descartes at once a metaphysical and causal doctrine, and thereby not merely a formal or logical distinction. Accordingly, in regard to Descartes's material world, we will argue that there is room neither for secondary efficient causes understood in the traditional Scholastic senses that involve substantial forms, nor for acts of transeunt causation between bodies acting across time. With this in mind, we begin our discussion of Descartes's journey to his mature position on bodies and motion, emphasizing on the way his developing views on human epistemic limitations that culminate in his epistemic stance.

The Early Descartes

In the *Rules for the Direction of the Mind* (c. 1628), Descartes discusses the dimensions of bodies, which he treats as modes with respect to which some subject is considered to be measurable. The modes are length, breadth, depth, weight, and speed. Modes "[either] have a real basis in

the objects themselves [or] . . . are arbitrary inventions of our mind" (AT 10:448; CSM 1:63). He goes on: "The weight of a body is something real (*est enim aliquid reale*), so too is the speed of a motion (*celeritas motus*), or the division of a century into years and days; but the division of the day into hours and minutes is not" (AT 10:448; CSM 1:63). We discussed this distinction briefly in chapter 1. We repeat it here to emphasize again that, at this stage in his thinking, Descartes takes speed to have a real basis in existing bodies.

It may well be that this "realist" view of motion in the *Rules* is a legacy of Descartes's association with Isaac Beeckman in 1618. In that year Beeckman gave three challenge problems to Descartes, one of which is the following: "whether it is possible for someone to know how much space a thing would cover by falling for a single hour when it is known how much it would cover in two hours, according to my foundations, viz., *what is once moved in a vacuum moves always*, and supposing there is a vacuum between the earth and the falling stone" (Beeckman 1939–53, 1:263, November 23–December 26, 1618). In his first and correct solution Descartes assumes that the force of motion in the first moment of fall is added to in a second moment that is equal to the first, and so on (Arthur 2007, 10). Descartes then offers a second solution that is of considerable metaphysical interest. He says "let God create an attractive force on the stone; and let Him create again and again at every single moment thereafter a new force equal to that which he created at the first moment; which, joined with the force created before, pulls the stone more and more strongly, since *what is once moved in a vacuum moves always*" (1618; AT 10:77).

In his elegant proof, Descartes employs a geometrically constructed triangle to represent the proportion between time, space, and force. He presents the construction of his diagram in terms of a thought experiment, whereby he assumes that God creates a new force at every moment that is represented in a constructed triangle by adding lines, each one in the same measure longer than its predecessor. Each line represents the sum of the forces effective in a given moment and created by God in this instant.[1] There is no evidence that, at this stage, Descartes sees theological implications in this model of instantaneous creation, as he will in the *Meditations*. He seems to use the creation talk to make plausible the idea of instantaneous motion. He needs this plausibility because at this time Descartes is a realist about motion and aware that motion cannot really exist at a moment. Later, he will make much more of instantaneous inclinations or tendencies, and, as we've seen, he generalizes this picture to apply to

[1] Robert Schnepf pointed out this passage to us.

God's creative action according to the notion of instantaneous creation moment by moment.

The importance of Descartes's encounter with Isaac Beeckman in 1618–19 is recognized by scholars (see Garber 1992, 10–11; Shuster 1977, 69–70, 94; Van Berkel 1983; Arthur 2007). Beeckman introduces Descartes to the idea that "things once moved never come to rest unless interfered with" (AT 10:60; Beeckman 1939–53, 1:24). Indeed, in his *Journal*, Beeckman records that Descartes "proceeded in accordance with my basic principles, that is, that in a vacuum, something once moved always moves" (ibid. 10:60; 1:263). Beeckman distinguishes his principle, according to which a body's motion *per se* continues indefinitely, from the notion of impetus, according to which a body's motion continues in virtue of an impressed impetus that acts as the cause for its moving and continuing to move (Garber 1992, 197; Van Berkel 1983; Arthur 2007, 12–13). We can speculate that Beeckman's principle almost certainly contributed to Descartes's later understanding of motion as it is formulated in his laws of nature in *The World* and *The Principles*, especially the notion that a body moves or rests according to its nature alone if nothing impedes it. Other topics discussed with Beeckman (and important in Descartes's later thought) are the distinction between motion and the tendency to motion, the notion that motion is conserved, and the notion that a body moving in circular motion tends to proceed along a straight line. Central to Beeckman's program was a joining of physics with mathematics, which no doubt made an impression on the young Descartes. It's difficult to say what Beeckman understood by this. But according to Van Berkel's criticism of Shuster, Beeckman's understanding of the mathematics of nature did not rest on a mechanical view of the material world such as Van Berkel (1982) attributes to the later Descartes. Nevertheless, there can be little doubt that Beeckman's "physico-mathematics" helped to inspire Descartes's methodological program in the *Rules for the Direction of the Mind*. But it did more than that. As Arthur points out, Descartes's idea that bodies, shorn of any internal cause, persist in motion and rest directly as a result of God's conserving them, is recorded by Beeckman in his *Journal* (Beeckman 1939–53, entry 1620; Arthur 2007, 22). On this basis, and citing further evidence from Beeckman's *Journal*, Arthur argues compellingly that Descartes's originality is not as great as he later portrays it (AT 10:204). He acknowledges, however, that Descartes produced a system of thought that, though it incorporates much that he had learned from Beeckman, goes well beyond what Beeckman himself achieved in his piecemeal fashion. One important example of this is Descartes's early adoption of a rectilinear representation of space according to which space is conceived to be everywhere parallel to itself and devoid of an intrinsic reference to a privileged center. It is within a rectilinear

spatial framework that Descartes thinks out the implications of his laws of motion (Miller 2006).

From late 1628 to the early 1630s, Descartes's thought takes a metaphysical turn, and he begins to consider metaphysical questions, concerning God, the soul, and the foundations of truth (see chapter 1). How these concerns change and how they affect his conception of bodily motion is the topic to which we now turn.

Cartesian Conservationism

A casual inspection of *The World* and the *Principles* reveals many points of agreement, especially concerning the structure of the world and the laws that govern it. We discussed some of these points in chapter 1; we need now to reiterate some of them in this context in order to make clearer Descartes's progress. Although both works argue that God's immutable action is the ultimate ground of what happens in the material world, at the epistemological, theological, and ontological level significant differences separate the two works. In what follows we will attempt to make these differences and their consequences apparent.

In *The World* (c. mid-1630s), Descartes argues unmistakably that God creates the world to be self-organizing; that is, the world is set up after the initial creation so that no further divine action is necessary. Specifically, God instills motion in parts of matter such that they are conserved: "I do not pause to seek the cause of their motions, for it is enough for me to take it that they began to move as soon as the world began to exist. And that being the case, I reason that their motions cannot possibly ever cease, or even change in any way except in respect of their subject. That is to say, the strength or power found in one body to move itself may pass wholly or partially to another body and thus no longer be present in the first, but it cannot entirely cease to exist in the world" (AT 11:11; G 9). There is no doubt that at this time Descartes conceives bodies to possess force or power by which they are able to act independently to move themselves and to pass this power on to other bodies. This means that he subscribes here to the principle of transeunt causation. Moreover, he argues that an exchange of real motion between bodies is constrained by the conservation of the total quantity of motion. Clearly, the picture is one in which God creates a world into which he instills bodily forces that produce motion that is conserved among all bodily exchanges. This is a conservationist picture, and, as we noted in the chapter 2, there is nothing here to suggest the re-creationism to which Descartes becomes committed in the *Meditations* and which we see later in the *Principles*.

Again, in chapter 5 of *The World*, a picture of enduring creation is implied according to which the world evolves naturally into the forms in which we find it: "each part of matter always tends to one of their forms and, once it has been so reduced, never tends to leave that form. Consequently, even if God had created only mixed bodies at the beginning, all bodies would nonetheless have had the chance to shed their forms and take on those of the elements" (AT 6:28; G 19).[2] This view is clearest in chapter 6, though there it is put in "the guise of a fable" (AT 6:31; G 21). Indications of this view in the treatise before the fable is introduced suggest that the fable guise does not undercut Descartes's conviction, as we argued above in chapter 1, concerning the "reality" of the position he is taking. He writes:

> For God has established these laws in such a marvelous way that even if we suppose that He creates nothing more than what I have said, and even if He does not impose any order or proportion on it but makes it of the most confused and muddled chaos that any of the poets could describe, the laws of nature are sufficient to cause the parts of this chaos to disentangle themselves and arrange themselves in such a good order that they will have the form of a most perfect world. (AT 6:34–35; G 23)

But Descartes is very clear that each body receives its motion from God: "Let us add further that this matter can be divided into any parts and according to any shapes that we can imagine, and that each of its parts is capable of receiving in itself (*recevoir en soi*) any motions we can also conceive. Let us suppose in addition that God truly divides it into many

[2] A host of such passages can be trotted out. Throughout the first chapters of *The World*, Descartes is clear in placing action in the world; the world unfolds and changes from within, with at least some of these changes not attributable to God's action. For example, in considering the burning of wood in chapter 2, he writes that "it does not seem possible to conceive how one body could move another except through its own movement" (AT 6:8; CSM 1:83). It appears that bodies have motion and through it are able to affect other bodies. Such a conception is ubiquitous. He writes that "the flame has the power to consume the wood," and it is not "necessary for [it] to possess any other quality [than the motion described]" (AT 6:9; CSM 1:84). In chapter 3 this point is generalized. (See, for example, AT 6:11; CSM 1:84–85). Again, in chapter 4 matter is said to cause changes in other matter; this is treated as "certain," and there is no hint that he is talking figuratively, loosely, or with the vulgar (AT 6:21–22; CSM 1:87–88). Or consider chapter 5, where Descartes writes that "not only these four qualities [heat, cold, moisture, and dryness] but all others as well . . . can be explained without the need to suppose anything in their matter other than the motion, size, shape, and arrangement of its parts" (AT 6:26; CSM 1:8). What should be recognized is that these are not isolated passages but form a coherent theme through at least the first parts of *The World*.

such parts" (AT 6:34; G 23). In chapter 7,[3] Descartes elaborates this picture, articulating "the means by which Nature alone is able to untangle the confusion of the chaos which I have been speaking about, and what the Laws of Nature that God has imposed on it are" (AT 6:36; G 25).

Descartes is subtle, but nevertheless clear, when he adduces theological support for a conception of natural philosophy at odds with his later view of God's ongoing re-creation of the world:

> by "Nature" here I do not mean some deity or other sort of imaginary power. Rather, I use the word to signify matter itself, in so far as I am considering it taken together with the totality of qualities I have attributed to it, and on the condition that God continues to conserve it in the same way that He created it. For it necessarily follows from the mere fact that He continues to conserve it thus that there may be many changes in its parts that cannot, it seems to me, properly be attributed to the action of God, because this action never changes, and which I therefore attribute to Nature. The rules by which these changes take place I call the Laws of Nature. (AT 6:37; G 25)

There are several noteworthy points in these passages. First, the active powers responsible for the evolution of the material world reside within matter and are described by its laws. We have once again a clear conservationist picture in which matter, once created, acts according to the powers and qualities of its own nature. One of matter's active powers is motion, which continues the view Descartes describes in the *Rules*, where he says that speed is ontically based in bodies. Second, while God conserves matter as he created it, Descartes does not treat divine conservation as an ongoing activity in the manner of the doctrine of continual creation he first develops in *Meditation* III. Third, since God's conservation is his action, and God's action is unchanging, the specific changes in the world's configurations cannot be attributed to that action, but instead are attributed to nature's action, that is to say, to matter and its parts and qualities as described by nature's laws. This is an obvious commitment to secondary causation in nature itself, the view that bodies, once created, act according to their natures alone. In other words, God's conservation provides an undifferentiated existence to every effect that comes into being by maintaining matter in existence together with the total quantity of motion and rest that inheres in it. But the variety of motions that individual bodies produce occur, once they are created, according to their natures

[3] Under the original (1664) heading of "By what Laws and by what Means the Parts of this World will extricate themselves, by themselves, from the Chaos and Confusion they were in."

and in accord with the laws of nature, independently of divine concurrence. In other words, God does not act immediately to maintain individual motions since this would compromise his immutability.

In the next paragraph, Descartes continues, now speaking specifically about matter and motion in the world:

> if God always acts in the same way and consequently always produces substantially the same effect, many differences in this effect occur, 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. (AT 6:37–38; G 25; italics added)

Although he indicates that God's conservation is his action, that action does not account for any specific changes in the world. God's action is immutable; but the world is ever changing. What is most striking about these passages is not that Descartes as yet does not hold a re-creationist picture, but that he takes his position to be "easy to accept" on the basis of God's immutability, which he considers to be accepted theological doctrine.

Descartes moves directly from the passage above to laying out "two or three principal rules by which we must believe God to cause the nature of this new world to act" (AT 6:38; G 25). Given that this follows immediately after, and is in accord with, the "metaphysical considerations" (AT 6:38; G 25) above, it indicates that Descartes's belief is more than just hypothetical. On the contrary: he really holds that God causes the world to act in accordance with these principles but, most significantly, that the action itself takes place in the world. Descartes then defines his first law of nature, namely "that each particular part of matter always continues in the same state unless collision with others changes its state" (AT 6:38; G 25). Here he formulates the notion that something "once moving is always moving" if not impeded, as well as the notion that motion is a state. But Descartes is most concerned to stress the nature of his conception of motion. "There is no one who does not believe that this same rule is observed in the old world, as regards size, shape, rest and a thousand other things. But the Philosophers have exempted motion from it, which is the one thing I most explicitly wish to include" (AT 6:37; G 25; AT 6:38; G 26). In Descartes's view, motion is here a clear and directly intuited notion, the nature of which is captured by the geometrical explanation of a "'line' as the motion of a point and 'surface' as the motion of a line." Criticizing the Scholastic notions of motion, Descartes declares, "I know of no motion other than that which is easier to conceive of than the lines of geometers, by which bodies pass from one place to another and successively occupy all the spaces in between." He adds that just as

rest is a quality attributed to matter while it remains in one place, so "motion is a quality attributed to matter while it is changing place." He elaborates, saying that "the motion I suppose follows the same laws of nature as do generally all the dispositions and qualities found in nature" (AT 6:39–40; G 26–27). Clearly, for Descartes, motion is a real quality in bodies, one generated by an inherent force or power that they possess. As we noted above, it is in virtue of the conservation of the total quantity of force of these bodies that their quantity of motion is also conserved. Once again we have a conservationist conception of how created bodies are related to God.

Descartes next states his second rule, which says that a body "cannot give the other [body] any motion except by losing as much of its own motion at the same time." Thus, no body "receives into itself the force of motion" unless the other body gives it up (*il reçoit en soi la force de se mouvoir que l'autre quitte*) (AT 6:42; G 28). A little later, he writes:

> Now these two rules follow manifestly from the sole fact that God is immutable and that, acting always in the same way, He produces the same effect. For on the assumption that He placed a certain amount of motion in matter in general at the first instant He created it, we must admit either He conserves (*conserve*) the same amount of motion in it, or not believe He always acts in the same way. (AT 6:43; G 29–30)

In articulating the third law (cf. the second law in the *Principles*), Descartes shifts attention to the motion of the individual parts of matter. Each part of matter's motion "depends solely on God's conserving everything by an ongoing action (*par une action continue*), and consequently on His conserving it not as it may have been some time earlier but precisely as it is at the very instant He conserves it" (AT 6:44; G 29–30). Descartes uses the famous sling example, which, as we will see in *The Principles*, is deployed in a different way:

> when a stone is swung in a sling, not only does it fly straight out when it leaves the sling, but while it is in the sling it presses against the middle of it and causes the cord to stretch. This shows clearly it has a tendency (*inclination*) to go in a straight line and that it goes in circle only under constraint.
>
> This rule rests on the same foundation as the other two, and depends solely on God's conserving everything by a continual (*continue*) action, and on His conserving it not only as it may have been some time earlier but precisely as it is in the very instant he conserves it. So of all motions, only motion in a straight line is entirely simple and has a nature that may be grasped wholly in an instant. . . . I do

> not say that rectilinear motion can take place in an instant, but only that all that is required to produce it is found in bodies (*se trouve dans les corps*) in each instant. (AT 6:44–45; G 29–30)

The picture here is that God creates each body with a real power in it that makes it tend to move along straight lines. This power is conserved by God in every part of matter at all subsequent moments. This action seems to differ from God's act of conserving the total quantity of motion in all the parts taken as a whole. But of course, God's immutability is singular, as are his acts, so his conservation of each part and his conservation of the whole are one and the same act. On this reading, the only changes that occur in the world are that the parts of matter change directions (see McLaughlin 1993 for an analysis of this reading and disputes about it). These nonlinear irregularities of motion are explained by "various dispositions of matter," which are clearly genuine secondary and horizontal causes. Descartes states: "According to this rule, then, we must say that God alone is the author of all the motions in the world in so far as they exist and in so far as they are straight, but that it is the various dispositions of matter that render the motions irregular and curved" (AT 6:46–47; G 30).

This division between motion and its determination (or directional component) had been worked out by Descartes in the *Optics*, finished around the time of his early work on *The World*, perhaps as early as 1630, but no later than 1632 (CSM 1:109–10). Specifically, Descartes tells us that "the power, whatever it be, which causes the movement is different from that which determines it to move in one direction rather than in another" (AT 6:94; O 75). The separation of movement (and its cause) from its determination of direction gives Descartes a way of explaining reflection, since the quantity of motion of a particle impinging on a mirrored surface remains constant, while, at the same time, the directionality reverses itself upon impact (*Optics*, *Second Discourse*; AT 6:93–96; O 75–77).

We noted at the beginning of our discussion of *The World* that Descartes places his laws of nature in a section in which he purports to be describing an imaginary world, a fable. This occurs after Descartes has laid out the nature of light and the details of his particulate structure of matter, all of which are described in a very realistic manner. He employs the device of the fable in order to limit his discussion to basic principles so that he does not have to take into account the totality of the world as a whole. That is, it is a literary device that allows him to focus on the basic principles by which the world operates, without at this point going into the complex phenomena that experience provides. Understood in this sense, we believe that the fable ploy cannot be construed in a way that

undermines the certainty or truth claims about the nature of the world, matter, and motion. Indeed, Descartes says of his "imaginary" world, "let us attribute to it . . . a nature in which there is absolutely nothing that everyone cannot know as perfectly as possible" (AT 6:33; G 22). Daniel Garber concurs in this view regarding the realism lying behind Descartes's fable. Garber claims that Descartes's position in *The World* is "that we can have genuine certain knowledge of the corpuscular substructure" (2001, 113). As we shall argue shortly, we agree with Garber that Descartes's later use of hypotheses in the *Principles* is radically different from what occurs in *The World*, although we shall differ somewhat in our view of the extent and nature of this change.

When Descartes publishes his *Discourse and Essays*, in 1637, he has already shifted to a more metaphysical way of thinking in line with theological orthodoxy. This is evident in the *Discourse on Method*, in which he states the mind-body distinction and introduces the cogito argument as a common notion, but he also begins to rework his ideas on the nature of matter and motion. At this time, however, he is still an unmitigated realist about motion as an active property present in the nature of material bodies. In the *Discourse*, Descartes writes that he had "tried to explain the principles of these truths [i.e., certain laws that God has established in nature and of which he has imprinted notions in our souls] in a treatise [*The World*] which certain considerations prevent me from publishing. I know no better way to make them known than by summarizing its contents here" (AT 6:41; O 34).

This summary of his views in *The World* introduces an importantly new element when he says that the laws of nature are such that God has imprinted these notions in our souls. This shows again, as we have claimed, that the discussion of the laws of nature in the fable of *The World* must be taken as true since they are part of our innate knowledge. He explains his use of the fable further by saying he discussed "certain laws which God has established in nature" (AT 6:41; O 34) and articulated them under the guise of a fable to avoid the disputes of the learned. Descartes then repeats what he said in *The World* about the self-sustaining character of nature.

> I even resolved to leave this whole world to their disputes, and to speak only of what would happen in a new world, if God were now to create somewhere, in imaginary space, enough matter to compose it, and if He agitated the parts of this matter diversely and without order, so that He made of it a chaos as confused as the poets can imagine, and if afterwards He did nothing else except lend His ordinary concurrence to nature, and left it to act according to the laws which he established. (AT 6:42; O 35)

This corresponds to the conservationism that is articulated in *The World*, and it shows that Descartes is still wedded to that position as late as 1637. While God's "concurrence" is necessary for the world's continuation, once created, nature can act alone according to its laws. Thus, there is no compelling reason to read the phrase "ordinary concurrence" as indicating God's immediate cooperation with nature's actions according to the laws of nature. As is the case in *The World*, where Descartes speaks of God's conservation of nature in the sense that nature acts on its own, so in the *Discourse* Descartes is clearly taking the same conservationist position. However, in the *Discourse* we also find the following statement: "But it is certain—*and this is a commonly accepted opinion among theologians*—that the action by which God now conserves it [the world] is the same as that by which He created it" (AT 6:45; O 37; emphasis added). In this passage, Descartes introduces the concept of creation, which he now equates with conservation; a doctrine not found in *The World*. Nonetheless, the passage goes on once again to stress the self-organizing nature of the world, which characterizes God's detached governance of the material world, that is, the claim that bodies in virtue of what they are follow the laws he has established.

As late as 1640, Descartes is still a realist about motion. He holds that God creates motion in bodies, but once created, bodies move on their own. Indeed, Descartes comments on this point in reference to a letter he had received from one Friar Blaye: "He is right in saying that it is a big mistake to accept the principle that no body moves of itself (*nul cors ne se meut de soy-même*). For it is certain that a body, once it has begun to move, has *in itself* (*a en soy*) for that reason alone the power to continue to move (*la force de continuer á se mouvoir*) just as once it is stationary in a certain place, it has *for that reason alone* the power to continue to remain there" (letter to Mersenne, October 28, 1640; AT 3:205; CSMK 155; emphasis added).

However, after publication of the *Discourse*, Descartes begins to think about and work on his *Meditations*, with the intention of producing a sustained metaphysical answer to his critics (see letter to Vatier, February 22, 1638; AT 1:560; CSMK 85–86). His metaphysical musings seem to have led him back to the idea of instantaneous creation, and probably recalled him to his brief flirtation with creation moment by moment (which we saw as part of his geometrical model in his early work with Beeckman). It is this idea that he begins to work out in the *Meditations*.

Re-creationism first emerges and functions as a foundation for promoting his metaphysical program in *Meditation* III (as we argued in chapter 3). There he says that God's act of conserving requires the same power as creating (now based on an argument from the nature of created existence and most importantly the nature of time).

While the *Discourse* makes the equation between creation and conservation, it's connected neither to the notion that the parts of time are independent nor to the cogito. In the *Discourse* we read: "there is nothing at all in this proposition I think, therefore I am which assures me that I speak the truth, except that I see very clearly that in order to think, it is necessary to be" (AT 7:33; O 28). In the *Meditations*, as we saw, the cogito is expressed in a temporally indexed manner—"this proposition, *I am, I exist*, is necessarily true *whenever* it is put forward by me or conceived in my mind" (CSM 2:17; AT 7:25; emphasis added). As we have shown in chapter 3, *Meditation* III links the temporally indexed structure of the cogito to the temporal structure of the life-span argument. What it is essential to grasp here is that the parts of time are *causally independent* and can be considered as small as one pleases, like the moments or instants that Descartes employed in constructing the diagram for Beeckman many years earlier.

So one major contrast is this: when Descartes said in *The World* that nature is self-organizing, he implies that future states of the world are contained intrinsically in the nature of matter. But now at the time of the *Meditations*, the observed order of nature lies in the orderliness of God's continual act of re-creation, rather than in the action of causal powers situated in created matter. In other words, the metaphysical doctrine that the parts of time are causally independent entails that the world's future states are no longer contained intrinsically in the world itself. The instantaneous creation of the world moment by moment, when brought together with Descartes's new and strict interpretation of creation and conservation as identical, requires him to find a way to describe God's orchestration of the motions and changes of things so that all creation is harmonious. He does not realize this fully as yet, but this decisive shift in ontology between *The World* and the *Meditations* now begins to pave the way for the emerging epistemic stance. Evidence that Descartes has not realized this shift in his thinking, is found in his continuing to hold a realist position concerning motion in *Meditation* VI.

Three Questions of Metaphysics: *Principles* Parts I and II

Descartes entitles Part I of the *Principles* "The Principles of Human Knowledge." It discusses many questions that customarily fall under the rubric of metaphysics, including the sorts of things that exist, so it seems odd that he should give it that title. Hence, the first question we need to ask is this: why does Descartes give this title to his exposition, in *Principles* Part I, of the metaphysics of the *Meditations*? This question must be answered prior to addressing one of the central claims we make throughout

our study, namely, that the natural philosophy of the *Principles* differs significantly from what we find in *The World*. Of course, the metaphysics Descartes establishes in the *Meditations* conditions in various ways what we find in *Principles* Part I. Moreover, it also provides a basis, as refracted through Part I, for the perspectivalist epistemology Descartes develops in Part II. That said, the challenge before us is to give these contentions plausible content.

We can answer the first question by first recalling Descartes's letter to Mersenne of April 15, 1630. He tells him that his physics rests on knowledge of himself and God, and that he has "found how to prove metaphysical truths in a manner which is more evident than the proofs of geometry" (AT 1:141; CSMK 22). On the face of it, this is a new conception of metaphysics, and it is at odds with the Aristotelian-based views of the Scholastic tradition. To the extent that he claims his views rest on knowledge of his existence in relation to God's, Descartes's metaphysics is a species of "special" metaphysics, namely, that discipline which studies insensible beings or substances that transcend the physical world. It is new, however, because he also conceives metaphysics to be that discipline which establishes nonsensory and self-evidently *certain* truths by means of reasoning more rigorous than the techniques of geometrical reasoning. In other words, for Descartes, metaphysics is a rigorous intellectual discipline that delivers *certain knowledge* to the extent such knowledge can be established by the power of the natural light. Certainly, the Platonic and Neoplatonic traditions conceived metaphysics as the study of insensible beings understood by the intellect alone independently of the senses. What Descartes adds to this is the strict requirement that metaphysical knowledge must be certain knowledge, that is, knowledge established only by rigorous reasoning that surpasses even that of geometrical science.

Now, as we've indicated, we don't know how far Descartes had succeeded in giving content to this conception of metaphysics circa 1628–30. But with the publication of the *Discourse* in 1637, his position appears to have gained content. In Part IV, he announces, but doesn't use, his "rule of truth," which appears neither in the *Rules* nor in *The World* but has a prominent role in the *Meditations*. This rule says that, though we may have difficulty in recognizing things that are distinctly conceivable, nevertheless the things that "we conceive very clearly and very distinctly are all true" (AT 6:33; CSM 1:127). Putting together what Descartes tells us, we can conjecture about the nature of the metaphysics beginning to take a shape in 1637 that eventually comes to fruition in the *Meditations*. Its content would appear to be this: (1) no metaphysical truth is to be upheld unless it is based on *ideas* that possess the mark of clarity and distinctness of the sort evident in the truths of geometry; (2) either a metaphysical truth is an intuitively self-evident idea and thus known by the "transpar-

ent clarity of cognition" (AT 7:192; CSMK 135), or it can be "proved" by the intellectual rigor that is found in the theorems of geometry. In the light of these two criteria, we can plausibly suppose that Descartes came to conceive metaphysics as the discipline that endeavors to fit the second criterion as close as possible to the first. Apart from what he tells Mersenne about the method of analysis in the *Second Reply*, this may be what he has in mind when he says that analysis was the "method which I employed in my *Meditations*" (AT 7:157; CSM 2:111). The overall structure of the *Meditations* may be seen as resulting from conceptual and logical analysis in the broad sense of the term. But if we look more closely, its arguments move from effects to causes and then from causes to effects, which is an obvious instantiation of one of the traditional conceptions of analysis and synthesis. Of course, given the meditative genre according to which the *Meditations* are written, they don't share the explicit pedagogic aim enshrined in the formal procedures of the synthetic method.

Given this reconstruction of Descartes's route to the metaphysics of his mature period, we now turn directly to why *Principles* Part I has the title it does. On the basis of our reconstruction, it seems clear enough that Descartes gives an epistemic gloss to the notion that metaphysics studies separable and insensible substances. It is, of course, the science that studies the nature of being—in Descartes's case two of the highest beings, the self and God. But it's also the science that pursues this study with the aim of establishing with *certainty* basic truths that are clearly and distinctly conceived through the procedures of rigorous reasoning. Thus, in Descartes's conception of metaphysics, epistemological and ontological elements are inextricably connected together. This contention is supported by the preface to the 1647 French edition. It comes as no surprise to read that "The first part of philosophy is metaphysics, which contains the principles of knowledge, including the principal attributes of God, the non-material nature of our souls and all the clear and distinct notions which are in us" (AT 9.2:14, 16; CSM 1:186–87). Descartes goes on to state that when his *Meditations* and *Replies* had "sufficiently prepared the minds of my readers to accept the *Principles of Philosophy*, I published these too. I divided the book into four parts. The first contains the principles of knowledge, i.e., what may be called 'first philosophy' or 'metaphysics,' so in order to gain a sound understanding of this part it is appropriate to read first of all the *Meditations* which I wrote on the same subject" (ibid.).

Notice that Descartes includes innate ideas in his "first philosophy," which for him are the foundations of the "principles of knowledge." His reference, of course, is to human knowledge, and, as is clear from the *Meditations*, chief among the innate ideas we possess are ideas of the self and God, the indispensable bases for everything we can know. This indicates the radical character of Descartes's metaphysics: given the over-

all structure of the *Meditations* it is based on reflective scrutiny of the *internal content* of two primary ideas, the idea of the self and the idea of God, both knowable prior to, and the bases for, everything else we can know. Indeed, the idea of the self, which "is innate in me" (AT 7:51; CSM 2:35), is the condition of the possibility of all other metaphysical ideas, including the innate idea of God. Thus, metaphysics is the discipline that, by attending to the content of ideas, traces out rigorously the logical, conceptual, and causal connections among them. Apart from the self-validating character of the cogito, and the idea we possess of an infinite being, these connections, given the guarantee of divine goodness, are able to be made manifest with clarity and distinctness. It is this that Descartes has in mind when he tells Clerselier that the most substantial notion of a first principle we can have is "that our soul exists." For it is "very useful indeed to convince oneself first of the *existence of God*, and then of the existence of all creatures, *through the consideration of one's own existence*" (to Clerselier, June or July 1646; AT 4:445; CSMK 290). Given this framework, Descartes proceeds to establish innate ideas of the nature of matter and change and the knowledge necessary for knowing the physical world. It is this line of reasoning that also lies behind his statement in the preface to the French edition of the *Principles* (1647)—which refers to *Principles* Parts II, III, and IV—that the second part of his philosophy is physics (AT 9.2:14; CSM 1:186). Since the *Principles* is laid out according to the format of a textbook, and not, as we've shown in chapter 1, according to the synthetic method, we should not be surprised that Part I contains topics traditionally placed under the rubric of general metaphysics. Thus, Descartes discusses the nature of existence, substance, the existence of God, the kinds of things there are, the distinction between mind and matter, particulars and universals, the theory of the distinctions, the nature of causation, duration, and time, free will and determinism, the infinite and the finite, eternal truths, the limits of knowledge, and the nature of error.

But this line of reasoning also shows why Descartes holds that Scholastic metaphysical thought is built on defective foundations to the extent it is based in the primacy of bodily sensation. For Descartes, this had led the Scholastics to make uncritical judgments based on the senses that contributed, for example, to the metaphysical view that bodies resemble our sensations (see *Principles* I.66; AT 8.1:32; CSM 1:216; and Gilson 1951 168–73). In contrast to this, Descartes believes that what human knowledge can reveal about matter is confined to simple "extension in length, breadth, and depth," which is seen by him as an analysis of, or reflection upon, our innate idea of matter. This view precludes Scholastic appeals to abstraction of substantial forms from sensory qualities (*Principles* I.53; AT 8.1:25; CSM 1:210)

The second question we need to consider is the extensive use Descartes makes, in *Principles* Part II, of epistemic qualifiers rooted in how we regard things relative to our perceptions and conceptions. Surely, if he sees tight logical, conceptual, and causal relations among the ideational contents of the mind and if, as such, these enable us to establish a framework for knowing the existence and nature of the material world, why in Part II do we find phrases that indicate that he thinks our knowledge is constituted in terms of what is epistemically viable for us? Our conjecture is this: The impact of re-creationism on his thought in *Meditation* II, together with the epistemic teleology that begins to emerge in *Meditation* VI, combine to produce the epistemic stance so evident in Part II of the *Principles*. As we have pointed out, the epistemic stance begins to appear in the *Meditations* and *Replies*. It does so, for example, in regard to Descartes's discussion of God as *causa sui* and his discussion of why it is that we must conceive God's existence in relation to the principle that everything has a cause. But it is not until the *Principles*, that we find epistemic perspectivalism present in his natural philosophy as a whole. The re-creationism of the *Meditations* reconfirmed his belief that human cognition is limited but not impossible. For he came to see more clearly not only the radical extent to which human existence depends on the inexhaustible power of God, but most importantly he became more aware that human knowledge must commence with innate notions that God sustains in our minds (the truths best known to us) and that are indispensable as rules of thought if we are to succeed in constructing a clear and distinct understanding of material reality. In this connection the epistemic teleology he develops in *Meditation* VI confirmed him in the belief that the end of practical cognition is to ensure our welfare and survival. But it did much more. It convinced him that theoretical cognition has as its end the business of establishing a science of nature, which can provide the concepts necessary for, and commensurate with, the human need to understand the physical world. The *Principles* are Descartes's attempt to do just that and they embody what we call the epistemic stance.

In this regard it's imperative not to underestimate the sustained religiosity that appears in *Meditations* III and IV. As we noted in chapter 3, Descartes makes much of subsuming the abject nature of the self beneath God's boundless power. Only in this way, as *Meditation* III makes clear, can we hope for a limited understanding of the way things are and practical knowledge sufficient to survive in the world. Thus there is a close connection between the dialectic relationship conducted between the self and God's infinite power in *Meditation* III and Descartes's doctrine—largely adumbrated in *Meditation* VI— that human knowledge is tied to an understanding whose ends are consonant with its cognitive powers and its needs for practical survival. This shift in Descartes's approach to

the self's relation to God in the *Meditations* will lead him into the very epistemically qualified metaphysics of the *Principles*, which contrasts dramatically with the metaphysical knowledge that he claims to have attained in *The World*. The atmosphere of the *Meditations* is well captured by Anne Ashley Davenport: "If we accept the finitude and work with it rather than fight it, if we abstain from trying to embrace God's infinity and instead rejoice that we know it, gratitude and duty will lead us to discover the created essences of creatures" (2006, 58). As we saw in chapter 3, the self confronts its finite origin and its contingent existence at each instant. But it also confronts, given its utter dependence on God, the limitations of its understanding. These interconnected issues could not emerge before the composition of the *Meditations*, and they will lead to a powerful division between the natural philosophy of *The World* and that articulated in the *Principles*. It is in this way that Descartes's theological reflections in the *Meditations* lead him in the *Principles* to an epistemic "ontology," despite the fact that the religious concerns that were previously so crucial almost virtually disappear in the later work.

This brings us to a third question. How do we explain the implausible impression Descartes gives in the *Principles* that he "deduces" his physics from the metaphysical foundations of Part I? Notoriously, Descartes writes about the relation between his physical and metaphysical principles as a "demonstration," a "deduction," a "derivation" or as having been "borrowed" from his metaphysics (see AT 7:602; 9B.2; 9B.19; 8.79; 6.8–9, 21–22). As Desmond Clarke points out, terms like "deduce" and "demonstrate," in Descartes's usage, do not mean anything close to what we mean. For example, the term *déduire* in the seventeenth century carried, as one of its basic meanings, the idea of "drawing out something" by making it explicit in a lengthy account. Thus, this usage yields the notion of "discoursing about something," by means of enumerating or laying out long chains of reasons in a narrative (Clarke 1979, 99). This conception is a far cry from the modern notion that deductions are patterns of formal truth-preserving inferences involving relations of strict implication. That this is Descartes's understanding of the term *deduire* is borne out by the *Rules*, in which inferences (*illationes*) paired with intuitions are often characterized as inductive enumerations gathered from the evidence. (See Rule 12, where Descartes discusses gathering [*collegere*] the properties of the magnet from available experiences [AT 10:427; CSM 1:49].) Clarke also makes a similar point about "demonstration" (*demontrer*, *demonstrare*). It can mean to explain, "in the sense of explaining a physical phenomenon by reference to its hypothetical cause, or to prove, in the sense of confirming or corroborating a hypothesis by looking at the available evidence in its favour" (Clarke 1979, 96). Descartes's use of "deduction" also carries the same ambiguity. Anyone familiar with Descartes's

texts will recognize that he commonly uses these terms to mean explanation rather than proof, and that his reasoning in these contexts is not captured by patterns of deductive logic.

But if Descartes doesn't hold that his physical principles are "deduced" (where that term is understood as logical implication) from his metaphysics, what is the relationship between the two? As we noted above, an account of this relationship should aim to show that the metaphysics and the physics are compatible (in some sense) with one another and (a point we add here) also show the relationship to be loose enough that, should the physics turn out false, this would not in itself discredit the metaphysics. After all, it's the metaphysics that establishes unassailable and certain knowledge and functions as the arbiter for explaining the errors of the senses on the basis of which, in Descartes's view, bad physics has been constructed. Moreover, there's no firm demarcation between the metaphysical principles of Part I and the principles of Part II. For example, the immutability of God, a key metaphysical principle in Part II, is only briefly mentioned in article 33 of Part I.

In our view, the physical principles of Part II derive explanatory import from being supported by his metaphysical or more general epistemological principles, but they also introduce new subject matter concerning the general nature of the material world. What we mean in claiming that Descartes's physical reasoning is "supported" by his metaphysics is exemplified by what he tells us about the relation between divine immutability and the laws of nature. In article 37 of *Principles* Part II, which states the first law of nature, Descartes says: "*ex haec eadem immutabilitate Dei, regulae quaedam sive leges naturae cognosci possunt*" (AT 8.1:62; CSM 1:240). The key phrase is *cognosci possunt*, which can be rendered as "are able to be known." Thus, the weight of Descartes's statement is on what we are able to know given our belief that God in virtue of his immutable nature operates in a simple and constant manner with respect to the created world (AT 8.1:54; CSM 1:242). In short, God operates as a regulative principle of human knowledge in virtue of his being the basis and sustainer of truth. Accordingly, in our view, this principle can be read as saying (though it must be parsed out carefully) that God's immutable nature is the ultimate source with reference to which we are justified in exercising our cognitive ability to know, calculate, and work with the laws of nature. To this end, we will argue in the next section that the relationship between divine immutability and the laws of nature is epistemic in character and not one of logical derivation. On this view, divine immutability can be said to "support" our human ability to know the laws of nature, not because it supplies the "content" from which they are derived, but because it guides the epistemic business of conceptualizing and using the laws in the light of experience. Thus, according to our inter-

pretation, Descartes does not have a problem of demarcating metaphysics from physics since the laws of nature are neither contained in, nor derived from, his metaphysical principles.[4]

Recall that Descartes holds a strong voluntarist conception of divine freedom. Hence, the world that exists is what it is because of the unconstrained exercise of God's omnipotent will. It's not surprising, then, that in Parts III and IV of the *Principles* he makes it abundantly clear that experience is necessary in order to determine the sizes, shapes, and positions of particular parts of the extended world of matter. For it is possible that "the supreme craftsman of the real world could have produced all that we see in several different ways" (AT 8.1:327; CSM 1:289). It is precisely because we believe in God's immutable actions that we look for causal relations among the particulars in the world and endorse them if they are confirmed and unified by experience in a simple manner (AT 8.1:62, 64, 65; CSM 1:240, 242). Thus, explanations take the form of moving either from known effects to a possible cause(s), or from causal suppositions that direct reasoning to the observable effects to be explained. Descartes's overall metaphysics of creation is clear. When God created the world by an unconditioned act of will, the laws of nature were made true in the world, and innate knowledge of the general structure of causality was implanted in the human mind. Nevertheless, although the contents of these innate truths are present in the mind, they remain latent unless we work meditatively to make them clear and distinct and to learn by experience to make them particular.

Mature Motion

To begin to get a handle on Descartes's epistemic shift, as it plays out in his metaphysics of matter, let's look at what he says at the time he begins working on his textbook, the *Principles of Philosophy*. As we have seen, up to this point he takes motion to be an intrinsic property of matter, although he has rejected Scholastic real qualities and presumably all substantial forms. On April 26, 1643, he writes to Mersenne:

> Motion, and all other modifications of substance which are called qualities, have not greater reality, on my view, than is commonly attributed by philosophers to shape, which they call only a mode and not a real quality. . . . Since motion is not a real quality but only a

[4] See Nadler 1990 for the view that the content of Descartes's laws of motion is deduced from, and fully determined by, his metaphysics; whereas the truth of the laws is open to confirmation by experience. For a contrary view, see Biener 2008, who treats the relation between metaphysics and physics as subalternation.

> mode, it can only be conceived as the change by which a body leaves the vicinity of some others (*le changement par lequel un cor s'esloigne de quelques autres*). (AT 3:648–50; K 135–36)

Again Descartes is denying the existence of real qualities, especially if they are conceived as souls or minds (as intentional actions), but at this time he is also denying that natural powers inhere in matter. As we noted in chapter 1, this is the first occurrence in which Descartes invokes an ontology of modes to discuss motion, and it occurs *after* the period of the *Meditations* and the *Replies*. What is significant here is his concomitant shift away from motion conceived as a "quality" inherent in bodies to motion conceived simply as a relational mode. This is his first move toward motion conceived as the transference of a body from the vicinity (of some bodies) into the vicinity of others. It is these notions that will become central to the theory of the *Principles*.

We turn now to the epistemic shift in Descartes's thinking and how it affects his view of motion and body-body horizontal causation. It is no accident that in 1643 Descartes begins to conceive motion as transference, a relational mode among bodies, rather than as a quality that inheres in bodies. After the writing of the *Meditations* the implications of three commitments begin to crystallize in his mind: the view that matter is an essentially extended substance; the axiom that the parts of time are causally and mutually independent; and the doctrine of re-creationism. These all decisively influence his views on the nature of motion and how God relates causally to created bodies. In order to provide a context for a full discussion of these changes we will first expound the relevant doctrines of the *Principles of Philosophy* (1644). In the *Principles* Descartes makes clear that his commitment to God's active, inexhaustible power is absolute and unconditioned. In discussing the principles of material objects (the title of Part II) he is unequivocal about God's causal role:

> *That God is the primary cause of motion; and that He always maintains an equal quantity of it in the universe.*
>
> After having examined the nature of motion, we must consider its cause, which is twofold: the universal and primary one, which is the general cause (*causa generalis*) of all movements in the world; and then the particular ones, by which the individual parts of matter acquire movements which they did not previously have. As far as the general cause is concerned, it seems obvious to me that this is none other than God himself, who in the beginning [in the French edition: "from his own all-powerfulness (*de sa Toute-puissance*)"] created matter with both movement and rest; and now maintains in the sum total of matter, by his ordinary concurrence (*concursum ordinarium*),

> the same quantity of motion and rest that he placed in it at that time. For although motion is only a mode of the matter which is moved, nonetheless there is a fixed and determine quantity of it. . . . We understand that it is one of God's perfections not only to be immutable in His nature, but also immutable and completely constant in the way he acts (*operetur*). (II.36; AT 8.1:61; M 57–58)

This passage deserves careful scrutiny, since it contains most of Descartes's mature views concerning matter in relation to divine causation. As we will make clear, its full elucidation ties it back to Descartes's doctrine of re-creationism.

Descartes describes God as the primary, universal, and *general* cause of motion. This description does not appear in *The World* and is a developed position on Descartes's part. We propose that this claim be taken literally. God is the primary and universal cause in that he is the sole active power, the first cause of motion as it applies to all created things, the cause *secundum esse*, who "created matter together with movement and rest (*simul cum motu & quiete*)." The French edition emphasizes this power of God, saying that God is the primary cause "who from His own all-powerfulness (*toute-puissance*) created matter with movement and rest"(AT 9.2:83). Furthermore, God is the general cause in that his attribute of immutability is the genus under which motion must be conceived. But "motion itself is nothing other than a mode which is in moving matter itself (*Nam quamvis ille motus nihil aliud sit in materia mota quam eius modus*)." The phrase "in moving matter" refers to matter in general, and therefore to the relations of all the individual parts among themselves. The role that God's immutability plays, understood as a genus of motion, gets elucidated in the remainder of this passage in terms of constancy, which, as we'll see, means the way we conceive the motion of particulars in terms of their constant relations. The constancy here may be understood as what provides the equilibrium relations among bodies, though, of course, Descartes does not use the term, "equilibrium." This means that the *particular* causes of motion, which we humans experience, are conceived by us as relational modes of matter rather than as powers inherent in matter. So Descartes will have to establish another way of legitimizing his talk of action, force or power in the material world. The genus of motion takes on more detail, conceived through the method of exclusion, in that the three laws of nature are treated as species, which are subordinate (or specifically, stand in a subalternate relation) to God (see Biener 2008).

Motion is ascribed to the parts of matter and not to the material plenum as a whole. Descartes has said earlier in Part II that matter is a plenum (II.16–23; AT 8.1:49–53; M 46–50), so that, conceived in general terms, the material world is one body. Yet he says also that the identity of the

parts of matter and all their properties, "all the variation of matter, or all the diversity of forms, depends on motion" (II.23; AT 8.1:52–53; M 50). This creates a serious problem for Descartes, namely, how is it that the parts of matter can be individuated by means of these relational modes of matter?

Below we will consider the issue of individuation in Descartes's thought from the perspective of his epistemic stance (see Anderson 1976; Des Chene 1996, 272–341; Slowik 2001 for general accounts). But here we divert to comment on an interpretation of Descartes's view concerning the individuation of the motion of parts of matter that goes back to Robert Desgabets in the seventeenth century and that has been recently revived by Thomas Lennon (1994, 2007). We do this to distinguish our reading from what amounts to an idealist reading by Lennon. According to him, Descartes holds that "without mind there can be *res extensa* (the one extended thing) or *extensio* (extension) but there cannot be *res extensae* (extended things)" (2007, 30). In other words, for Lennon, the motion of the parts of extension are modes of extension that are merely mind-dependent and phenomenal; "hence, if individuation depends on motion, individuals depend on our conception" (2007, 38). He concludes from this that motion, for Descartes, does not exist in the sense that it refers to parts of matter that actually move. On the contrary, it is phenomenal and consists merely in modal discriminations of extension that depend on how change appears to us.

The text standardly taken to assert the existence of moving and mind-independent bodies is *Principles* II, article 23, which we have just quoted. For Lennon this text poses no problem for his Eleatic interpretation of Descartes, since in Lennon's view it does not assert "the actual motion of matter and its division into parts, but only its *mobility* and *divisibility*, to which all the properties that we perceive in it are reducible" (2007, 39). To be sure, Descartes does talk of divisibility of extension and the "consequent mobility in respect of its parts," adding that on this basis we attribute its capacity "to be affected in all the ways which we perceive as following from all the movements of the parts." But here Descartes is simply saying that we can only conceive of mobility in terms of its parts. He goes on immediately to assert that "If division into parts is only in our thought, nothing changes (*sit sola cogitatione, nihil mutat*): for variation in matter, or diversity in all its forms, depends on motion" (AT 8.1:53). Thus, there has to be a basis in things (*in rebus*) for this to be a justified way of thinking about the world. Indeed, in *Principles*, Part III, article 46, Descartes says that it's most reasonable to assume "that God, in the beginning, divided all the matter of which He formed the visible world into parts as equal as possible and of medium size" (AT 8.1:101; CSM 1:256). So we need to conceive of the world in a way that in some manner corresponds

to, or represents, what is really there in nature, and we do this by using our reason to suppose that God individuates parts, since motion is impossible without parts. This is why motion is not "Eleatic"; but it also shows how our knowledge of it is limited by what a coherent concept of motion presupposes.

We return now to the action of God as the primary cause of motion. By his ordinary concourse, God maintains in the whole of matter the same quantity of motion and rest, regardless of how it is distributed among the parts. That is, the term "ordinary concourse" refers to God's conservation of the total quantity of motion and rest, and not to his immediate concurrence with the particular motions of individual bodies. In this way too, he differs from the later occasionalists. Moreover, as is clear from *Principles*, Part I, article 21, Descartes now understands God's relation to creation according to the doctrine of re-creationism (as set forth in *Meditation* III) (AT 8.1:13; CSM 1:200). Accordingly, God's causal action, understood in terms of conservation, applies universally to motion as a genus or kind, such that he continually re-creates the material world at each moment to insure that, as a whole, there are no changes in the quantity of motion and rest. If this were not the case, God would be inconstant and mutable and, we may add, a deceiver. Notice two points, however: first, God acts in the same way at each moment in which he creates and conserves; second, as we'll explain later, divine immutability and conservation are important to human welfare in the *Principles* to the extent they relate to the needs of human knowledge.

As we argued in chapter 2 (and see Machamer 2000, 96–97) the end of science, for Descartes, is knowledge *only* insofar as it is useful. It is from this perspective that we need to understand Descartes's claim in *Principles* II.4 that by the intellect's use alone, "we shall perceive that the nature of matter, or body considered in general, consists not in being something which is hard, heavy, colored, or which affects the senses in any way, but simply in being something which is extended in length, breadth and depth" (AT 8.1:42; M 40). Since extension alone is matter's principal attribute, we may infer that matter is passive and inert. Moreover, having now rejected motion as a proper property of bodies, Descartes also denies that they possess power or force as part of what they are. In virtue of their natures, bodies can cause nothing. Descartes is now forced to provide a new definition of motion.

To elaborate, he first defines space or internal place: "Nor in fact does space, or internal place, differ from the corporeal substance contained in it, except in the way in which we are accustomed to conceive of it. For in fact the extension in length breadth and depth which constitutes the space occupied by the body, is exactly the same as that which constitutes the body" (I.10; AT 8.1:9; M 43). So the body and the space it occupies are

the same thing; the difference lies in the epistemic stance *we* take toward them. But we need another definition in order to talk about a body's changing place. For this Descartes introduces the idea of "external place," or place relationally defined by other bodies surrounding the body whose place we seek:

> For in fact the names "place" or "space" do not signify anything different from the body which is *said to be* in the place: but only designate its size, shape, and situation among other bodies. Moreover, in order to determine that situation we must take into account some other bodies *which we consider* to be motionless: and, depending on which bodies *we consider*, *we can say* that the same thing simultaneously changes and does not change its place. Thus, when a ship is heading out to sea, a person seated in the stern always remains in one place as far as the parts of the ship are concerned, for he maintains the same situation in relation to them. But this same person is constantly changing his place as far as the shores are concerned, since he is constantly moving away from some and towards others. Furthermore, if we think that the earth moves [and is rotating on its axis], and travels from the West toward the East exactly as far as the ship progresses from the East toward the West; *we shall once again say* that the person seated in the stern does not change his place: because of course *we shall determine* his place by certain supposedly motionless points in the heavens. Finally, *if we think* that no truly motionless points of this kind are to be found in the universe, as we will later be shown to be probable; then from that, *we shall conclude* that nothing has an enduring [fixed and determinate] place, except insofar as it is *determined by our thinking* (*nisi quatenus a cogitatione nostra determinatur*). (II.13; emphasis added; AT 8.1:47; M 45)

Later he adds:

> *we understand* by "surface" the common surface which is not part of one body more than of the other, and which is *thought to be* always the same provided that it retains the same size and shape. For even if the whole surrounding body, with its surface, is changed; we do not *on that account judge* that the surrounding thing changes its place if it maintains the same situation among those external bodies which *we consider* to be at rest. (II.15; emphasis added; AT 8.1:48; M 46)

Now it is important to notice the epistemic stance that comes to the fore in Descartes's articulation of place and space. As the italicized expressions indicate, he continually says "as we conceive," "which we consider," "by which we determine," and so forth. This perception or act of cognizing

is most evident in *Principles* II, article 13, where Descartes invokes the *perceived* relativity of motion made famous previously by Galileo's *Dialogues on the Two Chief World Systems* (1632, Day Two). He even uses the same boat analogy to make his point.

Descartes's mature definition of motion or movement indicates an important turn in his thinking:

> If, however, we consider what should be understood by movement, according to the truth of the matter rather than in accordance with common usage (in order to attribute a determinate nature to it): we can say that it is the transference of one part of matter or of one body, from the vicinity of those bodies immediately contiguous to it and *considered as at rest*, into the vicinity of [some] others. By one body, or one part of matter, I here understand everything which is simultaneously transported; even though this may be composed of many parts which have other movements among themselves. I also say that it is a transference, not the force or action which transfers, in order to show that this motion is always in the moving body and not in the thing that moves it (because it is not usual to distinguish between these two with sufficient care); and in order to show that it is only a mode [of the moving body], and not a substance, just as shape is a mode of the thing shaped, and rest, of the thing which is at rest. (II.25, emphasis added; AT 8.1:53–54; M 51)

It is clear that motion for Descartes consists in change of relational place, that is, in the transference of a body. It is the positioning of a part of matter, or individual body, relative to the bodies that immediately surround it. These surrounding bodies are considered at rest. As he says later: "I have stated that this transference is affected from the vicinity, not of any contiguous bodies, but only those which *we consider to be at rest*. For transference is reciprocal. And that exactly the same force and action is required for one transference as for the other" (II.29; AT 8.1:55–56; M 53; emphasis added).

Descartes does not conceive motion as an action or force that causes transference. To attribute force to matter would be to ascribe active properties to matter, as he had earlier in *The World*, the *Discourse*, and the *Meditations*. As Descartes says above, motion, for us, refers in fact only to transference, not to force or action. So why does Descartes make a reference to "force and action"? His reference can only be to God's action. God's immutability is the genus of motion through which we have to regard the moving parts of matter as species. God has endowed us with a concept of action with which we may think about matter, even though matter *per se* has no active properties. But Descartes wants to legitimate, in a secondary sense, the use of terms like "force," "impulse," "ten-

dency," or "inclination" because this is how ordinary people think and speak about such matters. And he wants to do this in a way that departs not too far from the ways ordinary speech explains how the material world works. So in *Principles* II, article 30, he writes:

> if we wished to characterize motion strictly in terms of its own nature, without reference to anything else, then in the case of two contiguous bodies being transferred in opposite directions, and thus separated, we should say that there is just as much motion in the one body as in the other. But this would clash too much with our ordinary way of speaking. (AT 8.1:56–57; M 54)

The epistemic qualifier concerning what is considered to be in motion or at rest is important, because in Descartes's plenum, in the actual world, everything is in motion, and nothing at rest. So we cannot require bodies to move relative to things really at rest as a condition for thinking or talking coherently about motion. Again, Descartes's epistemic perspective is paramount. We attribute motion to one body rather than to another, even though this is not really a correct attribution. According to our standard manner of speaking, "movement . . . as customarily interpreted, is nothing other than the action by which some body travels from one place to another" (II.24; AT 8.1:53; M 50). But this is incorrect too, as Descartes makes abundantly clear. Presumably we must speak like the vulgar, but think like the philosopher. So we can talk about action if we wish, or about one body's possessing all the motion; these strategies are necessary for communication among people. However, philosophically, we should not be fooled. From the philosophical perspective we must realize that such speech is only a *façon de parler.*

To be able to speak according to accepted usage is important to Descartes, for he uses this commitment, along with the principle of relational motion, in an attempt to avoid Galileo's "error" about Copernicanism. In *Principles* III, article 28, he argues:

> *That the Earth properly speaking, is not moved, nor are any of the Planets; although they are carried along by the heaven.*
>
> And it is important to remember here what was said earlier concerning the nature of movement; i.e., that (if we are speaking properly and in accordance with the truth of the matter) it is only the transference of the body from the vicinity of those bodies which are immediately contiguous to it and considered to be at rest, into the vicinity of others. However, in common usage, all action by which any body travels from one place to another is also called movement; and in this sense of the term it can be said that the same thing is simultaneously moved and not moved, according to the way in which we di-

> versely determine its location. From this it follows that no movement, in the strict sense, is found in the Earth or even in the other planets; because they are not transported from the parts of the heaven immediately contiguous to them. (AT 8.1:90; M 94)

Saving himself from the Copernican heresy, for which Galileo was condemned in 1633, is a serious motivation for Descartes. Establishing a relational way of handling motion allows him to publish, with what he thought was impunity, the *Principles of Philosophy*. However, it should also be clear, by this point, that fear of persecution is not the sole reason Descartes adheres to the principle of relational motion. It is also the only definition of motion available to him given his view that matter is simply passive extension and, as such, is devoid of intrinsic force or power. Conceived as passive extension, matter takes a central place in Descartes's doctrine of creation, now understood as instantaneous, continual creation, or divine re-creationism. This is because matter's passivity requires God's activity for its continual creation and existence from moment to moment, and this constitutes for us an epistemic need to think of it under the concept of action.

We now have to describe how Descartes's laws of nature, and derivatively his laws of collision, relate to his epistemic teleology. Recall that in *Meditation* VI the epistemic role of sensation has as its goal the preservation of the mind-body union. But now in *Principles* II, Descartes clearly extends his epistemic teleology to the development of fundamental principles for a scientific theory about the world, and in Parts III and IV to the business of explaining in detail the workings of our world. Recall too that these scientific principles, though epistemic, must be devised by Descartes in a manner that accords with his larger ontological picture of the fundamental harmonies that God displays in the created worlds of mind and matter. God's immutable action in the world allows for the possibility that humans can obtain knowledge. This reflects a turn in Descartes's thinking that is different from how he describes the intrinsically real powers that underlie the laws of nature in *The World*. Thus, one of the main differences between the *Meditations* and his earlier works and the later *Principles*, lies in the shift from talking about what is caused by real activities intrinsic to nature (and known truly by the natural light) to the epistemic stance of the *Principles* according to which what we may know of reality is limited, though our ability to know the material world is still grounded in the way it is created by God. Recall what Descartes says to Burman: "The reason I use the word 'appear' . . . [is that] what we 'see' must ultimately reduce to what 'appears' to us. And what appears to us requires the existence of material objects as a source of the ideas in question" (Cottingham 1976, 34; translation modified).

The first law of nature (II.37) provides the stabile point, the Archimedean epistemic fulcrum as it were, from which we judge changes: "each thing as far as it is in itself, always remains in the same state" (AT 8.1:63; M 59). But for us to understand these things, as we have noted, demands a way of thinking and talking about motion, so Descartes says that "from this same immutability of God, the rules or laws of nature, which are the secondary and particular causes of the diverse movements which we notice (*advertimus*) in individual bodies, are able to be known (*cognisci possunt*)" (AT 8.1:62; M59). Here the epistemic language differs markedly from the language he used in *The World* (AT 6:36–37; G 24–25). By assuming that the quantity of motion is constant we are provided with a baseline for attributing secondary and particular external causes when we notice a change. "Each thing, provided it is simple and undivided, always remains in the same state in so far as it is in itself, and never changes except by external causes" (AT 8.1:62; M59). Particular and secondary causes, the external causes, are the result of our epistemic attribution of causal roles to relations among individual bodies.

The distinction between the movement and the tendency or inclination to move (which we first saw in the *Optics* and in *The World*) is the difference between the actual path a body takes and its tendency at each moment to move in a straight line. We have to remember, however, that in the *Principles* this inclination talk is no longer about real motion: rather, it refers to a straight-line tendency or inclination to move directionally that is now Descartes's conception of natural motion. He repeats it clearly in *Principles* II, article 39, in stating his second law of nature:

> The second law of nature: that all movement is, of itself, along straight lines; and consequently, bodies which are moving in a circle always tend to move away from the center of the circle which they are describing. (AT 8.1:63; M 60)

Descartes describes this law further, saying, "each part of matter, seen in itself, never tends to follow along oblique lines but according to a straight-line, even though many of these parts are frequently forced to move aside because they encounter others in their path" (II.39; AT 8.1:63; M 60). So each body *seen in itself* must be taken to move in straight lines, but when we see bodies moving along oblique or curved lines we must attribute a cause. And of course, in a plenum, all bodies move along oblique lines, so we are entitled to attribute causes to everything we observe. He explains that this tendency is due to the "immutability and simplicity of the operation by which God maintains movement in matter." For him, this is a consequence of the principle of divine immutability to which he refers in talking about God as the primary cause of motion.

Another aspect of this epistemic perspective is brought out if we reconsider Descartes's commitment to the causal independence of the parts of time. In the *Principles*, the doctrine is generalized, from the first-person version in the *Meditations*, to include all humans:

> And nothing can obscure the clarity of this proof, at least if we consider the nature of time or of the duration of things; which is such that its parts do not depend upon one another, or even exist simultaneously; and that, accordingly, from the fact that we now exist, it does not follow that we shall also exist a moment from now, unless some cause (that is, the same one as that which first produced us) continually produces us, as it were, anew; that is, conserves us. (I.21; AT 8.1:13; M 11)

This rewrite of the life-span argument from the *Meditations* now applies to *us* (to all humans) and not just to me and my individual moment of meditating. These considerations occur within Descartes's program of doubt, and indicate his awareness of how the causal independence of the parts of time (since the axiom applies to all created things) deepens the problems of the relation between human minds and the material world. Specifically, Descartes now recognizes that even as he builds back up from the doubt that culminates in the cogito, limits are placed on what we can know about the world. Given that God is infinite, we are unable to speak knowledgably about his reasons for action, but must content ourselves with the cognitive ability he has given us to understand the created order:

> When dealing with natural things we will, then, never derive any explanations from the purposes which God or nature may have had in view when creating them (and we shall entirely banish from our philosophy the search for final causes). For we should not be so arrogant as to suppose that we can share in God's plans. We should, instead, consider him as the efficient cause of all things; and starting from the divine attributes which *by God's will we have some knowledge of*, we shall see, *with the aid of our God-given natural light, what conclusions should be drawn concerning those effects which are apparent to our senses*. (I.28; AT 8.1:15–16; CSM 1:202; emphasis added)

A conclusion Descartes tries to establish is that "it is one of God's perfections not only to be immutable in His nature, but also immutable and completely constant in the way He acts" (II.36, AT 8.1:61; M 58). This passage marks a subtle, but critical, shift from the way in which Descartes considers immutability in *The World*. There, Descartes's main emphasis is on the connection between God's immutability and straight-line motion. But his more general view is that since God's "action never changes,"

his immutability entails that many changes in the world cannot "properly be attributed to the action of God" (AT 6:37; G 25). Furthermore, God's immutable actions indicate a real distinction between primary and secondary causation.

By contrast, for the Descartes of the *Principles*, the immutability of God's way of acting is reflected in the constancy of nature's laws, which in turn are our formulation of how we understand the way God acts. In parallel with the shift from secondary to primary causation, the laws of nature shift from being intrinsically part of the structure of the world, and thus able to account for specific changes in the world, to a limited, though ontologically grounded, understanding of God's immutability and the constant manner of his way of acting. Underlying this shift is the fact that Descartes had not freed himself, even in the *Meditations*, from the reality of motion and the notion of productive causation in the physical world. This he has done by the time of the *Principles*, and, as we'll see shortly, in this work he conceives the laws of motion as epistemic rules, "which by God's will we have some knowledge of." These rules enable us to comprehend the workings of nature, for our own epistemic purposes, a cognitive act that reflects God's harmonious world. Moreover, the fact that bits of extension are part of the divine plan links them together by a relation of causation stronger than mere association. Consequently, this shift, as we will make clear, allows Descartes to speak of particular causes in the world in a way consistent with God's primary causation: "from this same immutability of God, we can obtain knowledge of the rules or laws of nature, which are the secondary and particular causes of the diverse movements which we notice in individual bodies" (II.37, AT 8.1:62; M 62). It is crucial to notice here that Descartes's point is an epistemic one: it is about our *knowledge* of particulars obtained by means of understanding the species—the laws of nature—that fall under the genus motion. Thus, Descartes's talk of secondary and particular causes refers to ways in which *we conceive* the causal roles among particular bodies in our experience. Yet it should be clear that Descartes is not an idealist or constructivist about motion.

So it is that Descartes descends to his third law of nature: "If a body collides with another body that is stronger than itself, it loses none of its motion; but if it collides with a weaker body, it loses a quantity of motion equal to that which it imparts to the body" (II.40; AT 8.1:65; CSM 1:242). The second law was about species of motion, but this law is about all the ways that particular bodies may move, conceived as being isolated in a closed system. So the relation among the laws is one of descent running from genus to species down to particular or individually moving parts.

Descartes, as far as we can ascertain, was the first seventeenth-century natural philosopher to make collisions among bodies, in a systematic way, the primary model for understanding change in the material world. In this he differs from Galileo, who had earlier used the Archimedean simple machines as his model of intelligibility (Machamer 1998, 60ff.). It seems likely that Descartes decided upon this model in his early discussions with Isaac Beeckman (AT 10:77).

We noted above that in *Principles*, Part II, article 29, Descartes introduces the notions of force and action in reference to motion understood as transference: "And . . . exactly the same force and action is required for one transference as for the other" (AT 8.1:55–56; M 53). We suggested there that this new reference to force could only be to the action of God's creative power. But Descartes, we also noted, makes extensive use of the vocabulary of force and power when speaking of causal relations among bodies. Moreover, in the passages we have been discussing, he invokes the notion of tendency to movement in contexts in which he employs the terms "force" and "power." How is all this to be understood in the light of Descartes's re-creationism and his commitment to an ontology of extended material substance? This question is decisive, since all parties to the debate concerning Cartesian body-body causation have to contend with *Principles*, Part II, article 43, in order to justify their interpretation. There Descartes explicitly considers "in what the force (*vis*) of each body to act on another (*ad agendum in aliud*) or to resist the action (*actione*) of that other consists: namely, in the single fact that each thing tends (*tendat*), so far as in itself, (*quantum in se est*), to remain in the same state, in accordance with our first law" (AT 8.1:66; CSM 1:243). Without question Descartes links bodily force with the notion that each body possesses a *tendency* to remain in whatever state it is. Nevertheless, how the equation of "tendency" with "force" is to be understood is not at all straightforward, and has led to many divergent interpretations.

In what follows we argue that in the *Principles* Descartes's ontology of extended substance, force, tendency, and re-creationism cannot be readily understood in terms of the standard doctrines of occasionalism, conservationism, or concurrentism. To begin, we suggest that according to the *Principles*, God stands to the world in two compatible ways: (1) as the primary causal agency of the existence of everything that happens; and (2) as the conserver of equilibrium conditions for motion, over time, distributed among created bodies. Recall that in the last chapter we articulated the principle of causal harmony that Descartes's conception of creation seems to presuppose. Causal harmony has a triadic structure. God creates bodies by willing (but recall that in God willing-understanding-creating-conserving are identical) them to be "natured" things that exist in the world. But at one and the same time bodies, as products of God's creative power, are the source of the created mind's ability to form ideas

of them in virtue of the created formal natures they possess. But note that bodies are simply extended, quantifiable things such that given their passive nature they can be transferred from the vicinity of one group of bodies to another. This tells us nothing about how they will behave specifically in relation to one another since, conceived as such, they are nothing more than "blank" quantities constituted by such and such extensions. It is God who must fix and conserve the various sorts of exchanges among them by filling in the "blanks" in terms of determinate sizes, speeds, and directions of motion. In other words, God plays an essential role as the conserver of determinate equilibrium conditions among bodies, and this provides a basis that allows us to calculate their exchanges with one another. Thus, in the *Principles*, Descartes elaborates his collision laws in terms of calculational rules for determining "how much motion of a given body is altered by collision with other bodies" (II.45, AT 8.1:67; CSM 1:244). He gives seven rules for calculating collisions that apply on the basis of the assumption that there are only two bodies that are perfectly hard and isolated from all surrounding bodies. That is, given the plenum, these rules apply only hypothetically to an isolated two-body system as an idealized case that could never have real-world existence in the context of Descartes's plenum. Nonetheless, the rules, as Descartes states them in the third law and in two-body collision cases, though unintentionally inconsistent, are meant to be models by which we humans, by way of calculation, may understand how the world works.

Ignoring the inconsistency of his collision rules, what picture of causal relations among bodies does Descartes leave us with? The conservation law allows us to calculate collisions among bodies given a fixed quantity of motion in the two-body system. But if we add what Descartes says about determination of direction (reviewed above), then the conservation law plays another and greater epistemic role. The conservation law and the directionality principle make it possible to find a ground for identity among bodies involved in collisions. That is, Descartes implicitly invokes an identity principle according to which we can make sense of the world.

Consider a two-body rebound case. At time t_1, body A is at place P_1, and at t_1, body B is at place P_2. Places P_1 and P_2 are defined by the surrounding bodies that we consider at that moment and at subsequent moments as being at rest. In the ideal case, they are given a place by their distance from one another.

t1: A B

In the next moment there is a change with respect to the distance body A is from body B; or with respect to both bodies A and B with respect to some surrounding bodies.

t2:

Now A and B are touching. They cannot interpenetrate; so they must stop and rest, or move away in one direction together, or rebound from one another. In the rebound case, Descartes holds that because they moved toward each other from t_1 to t_2 in a straight line, they must reverse their direction determinately in the same straight line away from each other.

t3: 

Now if God re-creates the world at each of these moments, in this case t_1, t_2 and t_3, then what he does is create A and B at each moment in a place different relative to each other (or to surrounding bodies considered by us to be at rest). We might say there is no "real" movement in the world, but only God's continual re-creation of bodies together with changes of relative place among them. Yet this transition or change *is* motion for humans, and it does describe how the world "really" is. It is motion according to Descartes's definition of motion understood as translation. And its cause is God, in accordance with Descartes's account of the primary cause of motion. Only in this way may we accommodate the fact that matter has no intrinsic force.

Daniel Garber (1992, 167–72; see also Des Chene 2000 and Slowik 1999) dubs this account of motion the "cinematic view," which for him amounts to the claim that motion is a Parmenidean illusion. But Descartes's motion is not illusory, since it is part of a coordinated system that allows us to calculate and identify various quantities of motion, and to explain why bodies that possess these quantities are in different places at different times. The vertical causal story is God's re-creationism, as we outlined above. The horizontal causal story is given in terms of modes of matter, which are merely modifications of extension, their quantities of motion determined in accordance with the collision laws and the differences between their relative positions at various moments. God's conservation law (and its instantiation in collision rules) is a law that ranges over temporal moments. The law is not known to us by experience; rather, it reflects God's immutable nature, which, for us, functions as a genus of motion and the sustainer of the equilibrium harmony through which he works in the world. God gives us the ability to discover these laws of nature through the use of common causal notions. This is why Descartes can give an analytic argument (or as he would say, an argument based on the method of exclusion) for the laws based on self-evident concepts and their definitions. But it is the harmony that is important. The conservation law manifests God's harmony in a way that allows us to make sense of the world by conceiving collisions among bodies as intelligible only in

terms of presupposed equilibria (e.g., conserved quantities). In more Aristotelian terms, and in the interest of clarity, the form (quantity) of a body A and the form (quantity) of a body B must maintain proper proportionality between successive moments of their subsequent existence. It is easy to see that this is the case in an isolated two-body system, though even here we cannot say which body is really moving. In a multibody system, we must make assumptions about which bodies are moving and which are taken to be at rest. Even so, absent an assumption of equilibria of this sort, there can be no way of identifying which bodies are involved in a given collision, and no way to make intelligible to ourselves how bodies interact with one another.

Of course, as a consequence of Descartes's commitment to re-creationism, we cannot know what "really exists in things." That is, given the causal independence of the parts of time, the changes we observe in the world cannot be actively caused *within* the world since, on this view, he unfolding of the changes would unite the divisions of time. Unlike the view Descartes presents in *The World*, the thesis of the causal independence of the parts of time commits Descartes to an expanded view of God's action. The early Descartes focuses on laws established in a persistently enduring world (i.e., in the totality of matter), and God's active participation is reduced to initial creation and remote conservation. The late Descartes maximizes God's causal participation in the world and thereby removes from the world *genuinely efficient* and secondary causes according to the way these notions are traditionally understood. What is left is only a geometry of relationships between particular bits of extension that nonetheless, being existent things, constitute a basis in the material world. This involves the radical view that matter is identical with continuous extension (II.10; AT 8.1:45; M 43). Every perceivable quality, motion included, has its reality in things (in this case its reality is the relation among a number of things or bodies) and so is based in modes of extension. But motion itself is not a thing, is not in itself a *res*. This picture differs from the Scholastic view, according to which certain real qualities are *res*, that is, entities really distinct from their subjects. This means that in Descartes's view, matter cannot be an inherently composite structure of prime matter, substantial forms, and real qualities.

But is the conception of motion we attribute to Descartes a causal view? Indeed it is! It is causal in the way horizontal causality must work given Descartes's claims about the nature of matter. Remember that, as Descartes conceives them, efficient causes so far as they are moving causes, that is, horizontal causes, pertain to states of things that can be altered through motion and replaced by new states that come to be or exist (*secundum fieri*). But what is altered are bits of extension "natured" to the extent they can be reconfigured (i.e., changed in direction and speed)

through contact, and consequently able to display different sorts of altered spatial arrangements. How does this picture satisfy Descartes's central notion that effects are "derived" from their appropriate causes? As we suggested in the last chapter, in contexts where "horizontal" causation is in play, Descartes probably construes "derivation" as a *sine quibus non* causal relationship. That is, if the cause is posited, the effect follows; if not, it cannot. This view of causal relationships or roles fits the sparse ontology of extended *res* to which Descartes is now committed. So under the collision laws, governed by the conservation of motion, bits of created matter continually come into contact such that their speeds and directions of motion are altered.

But now we need to consider how Descartes's equation of "tendency" talk with "force" talk (*Principles* II.43) can be interpreted. The first thing to appreciate is that Descartes's laws are defined for a "tendency" to move rather than for actual motion. This view, and its consequences, can best be seen in terms of the second law of nature in the *Principles* (third law in *The World*). Descartes tells us that "the cause (*causa*) of this rule, like the preceding one is the same, namely, the immutability and simplicity of the operation by which God conserves (*conservat*) motion in matter. For he always conserves the motion precisely as *it is at the very moment in which he conserves it*, and not according to how it might have been at some earlier time" (AT 8.1:64; CSM 1:242; emphasis added). Descartes illustrates this by returning to an example he had used in *The World*, namely, that of a stone's motion constrained in a sling and directed from a center of rotation. In *The World* the sling example is an illustration; but in the plenistically constrained world of *Principles* III it becomes the model for setting out his theory of whirling vortical globules.

When the stone moves in a closed circle of motion in the sling, according to the second law, it is disposed to move tangentially. But owing to the external constraint of the sling, it is diverted continuously along a curved path. Descartes illustrates this by a subjunctive claim: If the stone were released from the sling, it would straightway move along a tangent to its circle of motion. This endeavor or tendency manifests itself only at the instant the stone is released; it is present, nevertheless, at each instant of its revolution, even though the sling impedes the stone from actually moving along the tangent.

But this tendency falls under another description. As the stone turns in the sling, the string is drawn taut. Consequently, although the whirling stone tends to move in a straight line, the sling resists that tendency insofar as it restrains the stone. This interaction provides a basis for describing a second effect, namely that the stone can be viewed *by us* as receding radially from the center of rotation, the direction of which is altered at each successive instant. It is clear that these effects are considered in isolation

from the stone's complete and actual motion in a circle. This point is emphasized by Descartes in article 57 of Part III, where he argues that "there can be strivings (*conatus*) toward diverse movements in the same body at the same time" (AT 8.1:108). Clearly, the only ontology to which Descartes appeals is that of the second law (i.e., that every part of matter always in fact tends to recede along a straight line). Nevertheless, he brings this tendency or endeavor under two different descriptions: an endeavor to move tangentially from the circle of revolution and an endeavor to recede radially from the center of revolution. It is this second description that Descartes uses to characterize the globules of the first and second elements when he claims in Part III that light consists solely in an endeavor to recede from the center of rotation of the sun's vortex (art. 60; AT 8.1:112). Just as the stone can be said to be constrained by the sling in its endeavor to recede from the center, so the effort of each of the globules to recede from the center of the vortex can be said to be restrained by those globules that are beyond it. In both cases, the endeavor to recede is balanced by a resistance.

In sum, there are three factors involved in Descartes's account of circular motion: the resistance due to an external constraint, and an internal "force of motion" that can be described under two aspects. The tendency to recede radially from the center is opposed by an external constraint, so that their effects are balanced. But no actual motion occurs along the string, because there is no real tendency toward the center. However, the tangential tendency is not so affected by the sling, as must be the case if Descartes's second law is to hold. This way of thinking of phenomena (i.e., as manifesting diverse tendencies simultaneously) is further illustrated by Descartes's analysis of the path of light through a refracting surface. He divides the surface into a perpendicular and a horizontal component. After the light strikes the surface, only the alteration of its perpendicular determination need be considered, because its determination parallel to the surface is in no way affected. Similarly, the sling acts like a refracting surface. It resists the stone's radial tendency to recede, whereas the parallel component, its tangential tendency, is unimpeded. What is important to see is that Descartes's tactic of invoking distinct but simultaneous tendencies works because each description ties back to the actual tendencies bodies have to conserve their states. Thus, the only real tendency is the tendency to move along the tangent. Since this tendency is always constrained or resisted in the world, we can also describe it as a tendency to move toward the center and away from the center. This allows Descartes to interchange these descriptors, and they well illustrate the perspectivalism inherent in the epistemic stance. This epistemic orientation differs decisively from his use of the sling example in *The World*.

What can we conclude from the second law and Descartes's treatment of the nature of tendencies? First, they are always directed toward the conservation of the future states of a body. Descartes affirms, rightly, that movement can't take place in an instant. Nevertheless, "every moving body, at any given moment in the course of its movement, is inclined to continue that movement in some direction in a straight line, and never in a curved one" (AT 8.1:64; CSM 1:242). In other words, at each moment in which it is moving, a body can be conceived as endowed with a tendency to preserve whichever of its future states result from exchanges with other bodies. Thus, there is a strong and intrinsic connection between a body's tendency to move in a straight line and the conservation of whatever state it *will* turn out to be in. This relation can be used to explain that cryptic but famous phrase we see in the first law of nature (*Principles* II.37) that "each body, *as far as it is in itself* (*quantum in se est*), always remains in the same state." This is true because each body's tendency, as it stands in relation to other bodies, is conserved by God in each independent part of time in accordance with the doctrine of re-creationism. Notably, the phrase does not appear in *The World*, and in the *Principles* it is linked to bodily tendencies and not to the conception of bodies endowed with internal forces by which they persist through time, as in the earlier treatise. In other words, these bodily tendencies explain the fact that bodies act to conserve their states, relative to other bodies, at successive moments of time according to God's harmonious plan. If God conserves the existence of material substances by re-creating them in each independent moment of time, by the same action he re-creates their natures independently of each prior moment of their existence.

The tendency to conserve states does not follow, of course, from the extended nature of bodies: nevertheless God, considered by us through his attribute of immutability as the genus of motion, has arranged bodies in this manner as a species or kind of motion that occurs at each instant in which he re-creates them. But how do *we* understand this? Quite simply, in relational terms. Notice first the way in which Descartes conceives an individual body to possess weight. One of his reasons for rejecting Democritus's manner of philosophizing is that he "attributed weight to . . . bodies, whereas I understand that there is no weight in any body considered on its own, but only insofar as that body depends on the situation and movement of other bodies, and relates to them" (AT 8.1:325; CSM 1:287). We can reasonably suppose that Descartes conceives the notion of "bodily tendencies to move" in a similar way. That is, the fact that each body is constrained by surrounding bodies supplies *us* with an *epistemic* warrant for ascribing a tendency to it that it does not possess on its own. Here it's important to notice that we are justified in ascribing tendencies to bodies because the ascription is based on actual and rela-

tional constraints that dictate the way they move or come to rest in Descartes's plenistic world. Remember also that Descartes thinks of the parts of extension, as they exist in this world, as being actually separate and as having particular sizes and shapes and conceived to be moving with certain speeds. This in turn means that these moving sizes or "bulks" mutually constrain each other in the plenistic world and thereby provide us with an experience of their interactive "tendencies" relative to one another. Although individual bodies themselves lack tendencies to move, we ascribe tendencies to them just in case they stand to one another in relations of constraint, as in the example of the stone held by the string. But there is also an ontic side to this picture. Cartesian bodies possess actual properties— for example, size, shape, and relations to other bodies— which, when they come into on contact with one another, make a physical difference as to how they are afterward disposed to one another. It is this picture of how bodies are "mutually disposed" that gives content to talk of the causal roles they play in Descartes's material world. Accordingly, in Descartes's world, bodies are not merely "occasions" for God to underwrite causal transactions among them: they themselves are responsible for these transactions in virtue of what happens when their properties come into contact.

From the larger perspective, the ascription of real tendencies to bodies is necessary for Descartes given his commitment to the two key principles already outlined: (*a*) the equation of conservation with creation, and (*b*) the causal independence of the parts of time. In light of these two principles, Descartes takes bodies to be fully geometrical in nature and isolated from their past, which leaves no room for laws to describe their motion across time. Thus, there is no specific future state of bodies that is implied in just one momentary part of time: rather, the actual relative position of bodies at a future time is given by their current positions and the one that precedes in conjunction with the laws of motion. This leaves two possibilities for Descartes: either God utilizes the history of the past states of bodies in re-creating them, or in each individual part of time bodies have a tendency for the future that we specify in terms of their causal roles, such that for us what they are is not captured merely in geometrical terms. It is the second possibility that is open to Descartes, given his commitment to (*a*) the equation of conservation and creation and (*b*) the independence of the parts of time. Imagine the first moment of creation. When God creates the world in the first part of time, it has no past history for him to consult in re-creating it in each subsequent and separate part of time. There can be no past history, because the distinction between God's act of initial creation and his subsequent acts of re-creation would have to be real, which violates Descartes's often repeated claim that they are only conceptually distinct. On the second possibility, the equation of cre-

ation and re-creation holds. At the initial creation and at each subsequent re-creation, God creates bodies in a relational whole with tendencies that, in conjunction with the laws of nature, individuate subsequent possibilities. Most importantly, this provides a clear motivation for Descartes's claim that God "always conserves the motion precisely as it is at the very moment in which he conserves it, and not according to how it might have been at some earlier time" (AT 8.1:64; CSM 1:242).

Compare the language Descartes uses to characterize motion in the sling in *The World* and in the *Principles*. In the earlier treatise he simply says that the stone "always has a tendency to go in a straight line and that it goes in a circle only under constraint." By contrast, in the *Principles*, as we have noted, he says that the stone is conserved "precisely as it is at the very moment at which he is conserving it, and not as it may perhaps have been at some earlier time" (AT 8.1:64; CSM 1:242). In the *Principles* Descartes no longer thinks in terms of the conservationism of *The World*. He is thinking in terms of re-creationism and the axiom of the independence of the parts of time. It is these doctrines that fit the sparse ontology of extended substance he articulates systematically in the *Principles*. Understood in this way, tendencies have for us a justifiable presence in the relational situation of bodies, but certainly not one that justifies attributing to them fully-fledged forces that persist across time. Thus, in our view Descartes is not committed to strong conservationism in any sense; nor is he committed to a form of concurrentism in virtue of having substituted the laws of nature for Aristotelian secondary causes (i.e., substances and their individual forms), as Helen Hattab argues (2007, 64–66, 69–76; see also Des Chene 2000). In other words, there is no need for God to perform a separate act of conserving the total quantity of individual bodily modes over and above conserving the total quantity of motion and rest in extended substances

The nature of Descartes's position in the *Principles* becomes clearer if, *ex hypothesi*, we attempt to interpret him as holding that bodies possess forces that persist through time. Since motion, for Descartes, is neither a substance nor a substantial form, it is not a thing (*res*) that comes into existence *per se*. Descartes no more wants substantial forms in the material world than he wants substantial forms of *species* or *eidola* in perception. If force were taken to be essential to the nature of an efficient cause, what difference would this make to Descartes's view of motion? It would make force or impulse a property of matter, that is, an efficient cause capable of creating motion. Minimally this supposition entails that matter must be more than mere extension. It also entails that matter can create motion; that matter, like God or like the human will, can efficiently cause motion to come into being where none was present before. On this supposition, matter would be a self-mover, a position even stronger than Des-

cartes holds in *The World*, where he conceives matter to be self-evolving. Descartes reaffirms that only God, or will, can be causes of motion, when late in life he writes: "The power causing motion may be the power of God himself conserving the same amount of translation as he put in it at the first moment of creation, or it may be the power of created substance like our soul, or of any other thing he gave the power to move a body" (letter to More, August 1649; AT 5:402; K 257; see also Descartes to More, April 15, 1649; AT 5:347). Defined simply in terms of extension, matter has no powers; therefore it is basically unintelligible that it could move itself. Perhaps one might think of Cartesian "inertia" as being self-motion. But this goes against what Descartes says when he claims that motion and rest are equivalent states that bodies tend to conserve. Being in a state just means that we have a law of harmony, that is, conservation, which ranges over every moment of time, and gives sense to claims that things are in the same state over time. This is the epistemic identity we spoke of above. And the role that the mind plays here is akin to its role in the wax argument in *Meditation* III, namely, that the intellect, not the senses or the imagination, grasps the essential identity of the wax through its transformations.

This discussion about causal powers in horizontal causality has an implication in the vertical scheme. Causation is possible only because both God and the human will are greater in perfection than matter, and so can efficiently create "motion" in matter (AT 7:138; CSM 2:99). With respect to God's efficient causation, this is done in accordance with the immutability of divine acts, which is why conservation holds. If the human will can create motion anew, rather than simply change the states of motion, then Descartes has a problem with conservation. But the will acts in accord with mind-body harmony, which is embedded in the mind-body teleological system. And if this system works in accord with the material-motion teleological system, then Descartes need not have a problem with equilibrium notions, since those we need for understanding are only local. (For a different view see McLaughlin 1993.) This alternative maintains that the creation of new motion in accordance with conservation holds only in "actually" closed systems. If, however, motion in the material world were a possible cause of other motion in the material world, of the existence of new motion rather than being just a function of "formal" proportional rearrangement, Descartes would have a real problem in regard to his ontology of conservation. Conservation would have to hold over actions or forces and other substantial properties of this sort.

When Descartes, in *Meditation* VI, said that material things possess active powers that cause our perceptions of objects, he was referring to the fact that material things are in motion. At that time, he thought that motion was a real property of bodies, something akin to a virtual substan-

tial form. Later, by the time of the *Principles*, motion understood as an active power, or a substance-like principle, becomes simply the way we humans describe motion, that is, as an activity in the material world. We need to be able to talk about, for example, inclinations to straight-line motions, though this does not describe a "real" substantial activity or a real cause. Causality in the material world works, for Descartes, via the causal roles that things may be said to have by virtue of their teleological harmony.

It is claimed by some scholars that the laws that follow from God's immutable action together with the states of matter at any given time have to concur to produce the particular motions we observe (Hattab 2007). On our view, Descartes's talk of "secondary and particular causes" does not refer to God's *immediate* concurrence with individual motions: it refers rather to the effects of God's immutable action in the world, his ordinary concourse, which we can conceptualize in terms of the laws of nature under God considered by us as the general cause or *genus* of motion. Indeed, the notion that a law of nature is an epistemic posit used by us to make nature's operations intelligible is probably what Descartes means when he says in the *Sixth Reply* that laws do not have the status of physical things but are merely "what they call 'a moral entity'" (AT 7.436; CSM 2:294). Thus, concurrentism is unnecessary and inappropriate to how Descartes understands God's relation to creation.

It is also clear from our earlier discussion that Descartes is not an occasionalist, since his harmony laws range over time and, moreover, there is an ontic basis underlying his talk about tendencies even though it is only the epistemic teleology that allows humans to construct intelligible relations among bits of matter from moment to moment. Of course, Descartes's voluntarism dictates that God need not act in this manner. But since Descartes's God is no deceiver, he chooses freely to allow humans to have "adequate" knowledge of the world. So on Descartes's picture, humans can do physics and learn about the material world, an ability that, at the end of the *Meditations*, he claims we possess. But in the *Principles* Descartes goes on to show how humans may do this with regard to the material world. That is what books II, III, and IV are all about, namely, getting scientific results. Descartes sums it up toward the end of his *Principles*:

> There are, even among natural things, some which we judge to be absolutely and more than morally certain; basing our judgment on the Metaphysical foundation that God is supremely good and by no means deceitful, and that accordingly, the faculty which he gave us to distinguish the true from the false cannot err when we use it correctly and perceive something clearly with its help. Such are Mathe-

> matical demonstrations; such is knowledge that material things exist; and such are all evident demonstrations which are made concerning material things. (IV 206, AT 8.1:328; M 287)

The Place of Our Position in the Current Debate

We have argued that God stands behind the world of bodies and is the direct cause of their motion. We have also stressed how bodies can be viewed as having a tendency to preserve their state of moving or resting at each separate moment in which they are re-created by God. We emphasized that bodily tendencies arise directly and completely from God's causal power, which preserves the same quantity of motion in the world. But unlike Daniel Garber and Gary Hatfield, we deny that occasionalism adequately characterizes Descartes's position in regard to body-body causation. In our view, Descartes conceives causality to operate in the material world through causal roles that hold among bodies whose nature is constituted by extension and its determinate modes. That is, created bodies possess determinate properties that make them what they are. They are sized, shaped, and positioned, all strict modes of extension. Given that they continually occupy different positions, we are able to calculate the values that index their changing directions and speeds relative to one another. Certainly, God moves bodies according to certain "rules or laws of nature"; but God's rule-governed activity isn't the whole story concerning changes that bodies undergo. God is causally responsible for the fact that they exist and continue to exist. But extended bodies subsist within the created order, and are thus able to exchange positions relative to one another according to the divinely instituted laws that govern uniquely their tendency to preserve their states. This means that God manifests his continual act of creating and conserving bodies with respect to causally independent parts of time in virtue of a set of harmonious correspondences: (*a*) bodies possess created natures, which are an instantiation of a creative source present in the divine mind; while (*b*) simultaneously finite minds, in virtue of the objective "contents" of their ideas, refer to the same bodies conserved by God's creative power. In each case, the modes of being of the natures in question differ: in the divine mind they exist eminently; in finite minds they exist in the objective content of ideas; and in the created order they have a formal mode of being, that is, they are subsistent entities within that order.

It is important to notice the status of the rules or laws of nature in the *Principles*: they are epistemic and allow us, as we have explained, to calculate the values of the conserved quantities of size times speed. God

is the efficient cause *secundum esse* of the physical world, and the laws that follow from divine immutability and govern the tendency of bodies to preserve their states allow us to measure the intensity of God's causal action. This shift in the status of the laws of nature from *The World* to the *Principles* reflects the impact of the re-creationist doctrine on Descartes's thought, an impact that did not occur before the development of the life-span argument in *Meditation* III. Moreover, the shift allows us to give an ontically based epistemic reading of Descartes's talk of forces in reference to bodies: it becomes talk about the fact that we can calculate changes among bodies produced by God's continual conservation of the physical world. Additionally, our interpretation does justice to Descartes's epistemic teleology and the minimalist ontology so evident in the *Principles*. Indeed, it satisfies his claim in *Principles*, Part II, article 64, that "I admit no other principles in physics but those in geometry and abstract mathematics" (AT 8.1:78; CSM 1:64).

But why do Guéroult, Gabbey, Della Rocca, and Schmaltz seek to ascribe an ontology of bodily forces to Descartes? Certainly, they want to save Descartes from occasionalism and are led to take up the following question. Does Descartes hold that extended bodies possess "force" simply in virtue of possessing the *actuality* of extramental existence? They answer yes. Della Rocca has the most straightforward version of the claim. He rests his case largely on *Principles*, Part II, article 43, where, as we've noted, Descartes states bodily force is to be identified with a body's tendency to maintain its state (AT 8.1:66; CSM 1:243). Citing Descartes's extensive use of the language of cause and force throughout the *Principles*, Della Rocca unhesitatingly interprets Descartes as making an ontic identification of force with bodily tendency, arguing that the tendency of extended bodies is "not simply in its character as a purely geometrical object but also and crucially in its relations to God." Thus, God and his immutability supervise relations among bodies such that the quantity of their resultant speeds and directions after mutual encounters is conserved. Accordingly, the fact that bodily tendencies are grounded in "God's immutability" is for Della Rocca the basis for Descartes's claim in article 43 "that bodies have force" that is genuine and real (1999, 60). In other words, for Della Rocca forces in Descartes's material world constitute genuine efficient causes.

If our interpretation is correct, an ontic identification between force and tendency that commits Descartes to the existence of persistent forces in the material world is unnecessary. Certainly, bodies stand to God in the sorts of relations that Della Rocca articulates. We agree, however, with Garber that the tendency grounded in divine immutability is not a genuine force in the conservationist sense to which in *The World* Descartes was committed. What is important to notice is that since Descartes

is a plenist, every body is forever impeded and unable therefore to travel along a straight line. But at each moment bodies possesses a specifiable tendency that can never be manifested. Thus, as we have shown, there is no compelling reason for attributing genuine forces to bodies. Nevertheless, as we've seen, our ability to speak of bodily tendencies justifies the force talk that Descartes uses.

Guéroult, Gabby, and Schmaltz also think there is every reason to attribute genuine forces to bodies. Guéroult grants that force is ultimately grounded in God, but claims nonetheless that forces "are immanent in 'nature' or extension and . . . can be calculated at each instant for each body, according to the formula *mv*" (1980, 198). He also claims that moving force "is nothing other than that power which—from within them—puts each one [body] in duration and consequently cannot be distinguished from their existence." Thus, for Guéroult, the forces bodies exert are identified with their tendency to conserve their states such that the force inherent in each body is "nothing other than that by which God puts it in existence at each instant." Not surprisingly, he concludes: "In reality, force, duration, and existence are one and the same thing under three different aspects, and the three notions are identified in the instantaneous action in virtue of which corporeal substance exists and endures, that is, possesses the force which puts it into existence and duration" (1980, 197).

This is a highly metaphysical interpretation, but it lacks direct textual support. The motivation, however, is clear: this is the idea that at each instant in which bodies are created and conserved by divine action they are endowed with an inherent force that puts them into existence and duration. In other words, Guéroult identifies the forces bodies exert with the fact that they exist and endure as extended substances in the world. Of course, these forces are not modes of extension; nevertheless, they are modes of *extended* substance just in the way existence and duration are modes of created things. The puzzling thing about Guéroult's picture is the identification of force, duration, and existence as common notions mutually interchangeable with one another. The problem is that Descartes nowhere cites force as a common notion on par with duration, existence, and unity. In article 55 of *Principles* Part I he says that "we should regard the duration of a thing simply as a mode under which we conceive the thing in so far as it continues to exist." And in article 57 we are likewise told that "when time is distinguished from duration taken in the general sense and called the measure of movement, it is simply a mode of thought" (AT 8.1:26, 27; CSM 2:211–12). Here duration is a mode that is "only in our thought" and not "in the very thing" of which it is said to be a mode (ibid. 27; 212). This makes it clear that duration, understood as temporal successiveness, is the measure according to which we conceive

the continued existence of anything, and therefore is not identified with the actuality of a thing's existence as such.

This brings us to Gabbey's interpretation, which he represents as an extension of Guéroult's. For Gabbey (1980), forces understood as what conserves bodies in existence are causes *secundum esse* and result from God's action as the cause of the continued existence of bodies. That is, with respect to bodies themselves, force is an attribute that is on par with their existence and duration. But, as Gabbey notes, the forces, which Guéroult identifies with the durational existence of bodies, cannot be identified with the changing forces of acting and reacting that Descartes posits in the *Principles*. Gabbey therefore introduces another kind of force that is in bodies as a variable mode rather than as an attribute. Thus, when forces are viewed in this manner, as "quantifiable causes of change in the corporeal world, or as reasons . . . explaining absence of change of a certain kind in particular instances, they are *causae secundum fieri*" that are "clearly in body *diverso modo*, and so are modes of body, rather than attributes" (Gabbey 1980, 236–37).

But if force is in body as a mode, what sort of mode is it? Gabbey doesn't say; but certainly understood as a mode of body, force can't satisfy Descartes's official position that everything in a body must be conceived as a strict mode of extended substance. Desmond Clarke (1996) introduces a special kind of mode into Descartes's ontology to underwrite the view that God projects various forces into matter in the form of inherent modes. Clearly this violates Descartes's sparse material ontology. Tad Schmaltz (2008) also attempts to illuminate the notion of force as a mode of bodies. He rejects re-creationism and interprets Descartes's account of temporal parts (i.e., the life-span argument) to say they are modally distinct features of the attribute of duration, that is, that this attribute has various distinguishable parts. He then identifies Gabbey's variable forces with the various modal parts that pertain to the duration of interacting bodies. In Schmaltz's view, if God is the cause *secundum esse* of the constant quantity of motion, then the "various modes of bodily duration are causes *secundum fieri* of changes in the distribution of this quantity among the parts of matter" (2008, 118). Accordingly, the tendency of bodies to persist in a state (*Principles* II.43) is a feature of bodies *in est* "insofar as they are simply varying modal features of the durations of moving and resting bodies" (2008, 119). So Schmaltz's key move is this: He appeals to Part I, article 62 of the *Principles*, where Descartes says that "because any substance also ceases to be if it ceases to endure, substance is distinguished from its duration only in reason" (AT 8.1:30; CSM 1:214). This passage Schmaltz interprets as saying that the substance and its duration are not distinct *in re* but only distinct conceptually or in reason. He takes Descartes to make a parallel move in regard to force: "On the view

I propose, he [Descartes] also holds that the strength of duration, or force, is only rationally distinct from the features of motion and rest that possess that sort of duration." Thus, for Schmaltz "the force or strength of duration is in no way distinct from that duration as it exists external to the mind." In other words, if we understand a Cartesian body "in terms of concrete extension, force can be conceived through the nature of body insofar as this force is identified with the strength of the duration that does not differ from the modes in reality" (2008, 119).

Notice that Schmaltz equates force with strength of duration and equates duration with the concrete existence of bodies. From this set of moves, he arrives at the view that the force of bodies is equivalent to their existing extramentally as concretely extended and enduring things. As we've noted, this conclusion turns on the supposition that extended objects possess certain features simply in virtue of the fact that they have extramental existence. It is not clear how this follows. What does it mean to assert that force is a function of concretely existing extensions in the sense that extension is presupposed in saying that something corporeal exists or endures? How do we understand the claim that bodies possess force simply in virtue of the fact that their existence endures through time? Or, more basically, what can it mean to say that God conserves the total quantity of motion *secundum esse*, since the quantity of motion as such is not an existent thing (a *res*)? We lack direct text for Schmaltz's identification of force with duration. But there are plenty of texts, which we discussed in chapter 2, in which Descartes firmly establishes a recreationist position and argues that the parts of time are independent of one another. These texts must be taken seriously, and they cast doubt on the plausibility of ascribing to Descartes an ontology of bodily force grounded in durational existence. Moreover, they support Descartes's minimalist ontology of extended substance.

Two salient points emerge from our discussion of Descartes's claim that the mutually independent parts of time are a common notion (see the *Second Reply*; AT 7:165; CSM 2:116): (1) the meditator's realization that he lacks, in virtue of his created nature, the intrinsic power to continue existing beyond the very moment at which he exists; and (2) his realization that whatever conserves his existence in the first part of time must act in the same way at each subsequent part in which he exists, where temporal parts never coexist and are mutually independent. Taken together (1) and (2) mean that the parts of time are *causally* independent, and that in each individual temporal part no created thing has the power to conserve its own existence. Thus, in the light of this conclusion, it seems implausible to claim that created things, in virtue of their natures, possess inherent forces capable of maintaining their duration across time, nor can it be said that they have these forces just because they exist as concretely

extended things. They exist because the act of divine efficient causation inheres in each independent temporal part of their duration just as it does in the initial moment of their existence. It is this view of God's action in relation to the parts of time that sits well with Descartes's repeated claim that bodies are geometrical objects made real, since it doesn't require bodies to possess an intrinsic principle of causal efficacy.

Our view is compatible with Garber's (1992, 293–99) to the extent that we hold that in Descartes's physical world no genuine forces persist in bodies. In our view, bodies that behave in accordance with laws that God's continual activity imposes upon them behave as if they persist in movement in proportion to their sizes. But in reality, they simply change relational places through contact and allow us to calculate speeds and directions according to the constraints conceptualized by those laws. If this is right, as Garber suggests, there is no need to ascribe inherent forces to bodies in the manner of Guéroult, Gabbey, Della Rocca, and Schmaltz. This doesn't mean that bodies lack created features in their own right. On the contrary: they exist as concretely extended things each of which possesses a *particular* size, shape, and position and also the capacity to have that position and the direction of their movement altered according to the laws of motion.

We part company with Garber when he claims that Descartes is a quasi-occasionalist who is committed to what Garber calls the "divine impulse" view of God's action. On this view, God is committed to two distinct actions: an impulse by which he causes motion "by sustaining a divine shove," and an action by which he sustains bodies in their existence (1992, 277, 297). In Garber's view, this does away with the need for inherent bodily forces, since if this is how God causes motion and rest in the world, "then the force of motion and the force of rest cannot be identified with the existence and duration of bodies in any direct way," as the theorists of bodily force attempt to do (1992, 297). This is an attractive move against the bodily force theorists, but unfortunately it doesn't work. In our view, apart from the fact that the "divine shove" interpretation rests on slim textual evidence (only on the late letters to More), it introduces unnecessary and unwarranted multiplications in the tasks God performs, whereas Descartes repeatedly tells us that God's act in creating and conserving the world is simple, unitary, and complete. Moreover, to conceive God as a cause of motion in this way is to conceive him merely as a moving cause—a God of divine shoving—who acts to affect *particular* changes in created things. Garber's view also violates Descartes's doctrine that God is indifferent to the contingencies of creation (AT 7:417; CSM 2:281). Moreover, it scarcely captures Descartes image of God as an inexhaustible power who, in virtue of his immutability, always acts in the simplest manner.

In face of these bewildering positions, we claim that three late Cartesian commitments must be upheld: (1) his minimalism regarding the nature of matter; (2) his view that each body, in virtue of its relational situation with respect to surrounding bodies, conserves its states, so far as it can, and stands to God understood to be the general or generic cause of motion in the world; and (3) his genuine espousal of re-creationism.

Chapter 5

MIND, INTUITION, INNATENESS, AND IDEAS

We saw in chapter one that Descartes shifts from a method of abstraction to an epistemology that analyzes concepts or ideas by exclusion. In chapter 3 we discussed the nature of our ideas and their grounding in God, and introduced Descartes's theories of divine harmony and epistemic teleology. In chapter 4 we showed how Descartes's theory of conservation needs to be viewed as an example of his epistemic stance. That is, the theory provides a framework of ideas that we use to understand the workings of horizontal or body-body causation. We now need to turn our attention to Descartes's concepts of mind and idea, and show how they contribute to our argument thus far. What becomes clear is that the manner in which we acquire an idea is not in itself the determining criterion of whether the idea is innate. Innate ideas are ideas in the mind that we use to understand our experience and are needed also to do science.

Much has been written on Descartes's views on innate ideas. Gilson has shown that Descartes's immediate cultural environment was thoroughly constituted by a commitment to innateness both in theology and in philosophy (Gilson 1953, 9–50). We are fortunate also to have a number of significant studies on detailed aspects of Descartes's views on innate ideas. Notable here is the work of R. M. Adams (1975), Robert McRae (1972b), John Cottingham (1976, xxxii–xxxvi), Frederick P. Van De Pitte (1985), Nicholas Jolly (1990), and Tad M. Schmaltz (1997). We have learned much from this work, but to a large extent our inquiry into innate ideas is driven by a different view of how the mind works.

Mind for Descartes is active, not just in acts of volition and judgment but, as we will seek to show, in a more extensive sense. Recall the important shift in Descartes's thinking when he moves from the method of abstracting features given through an immediate and intuitive experience, as in the *Rules*, to an epistemic position that focuses on the ideas present in our mind. We outlined his early doctrine of abstraction in chapter 1. The letter of January 19, 1642, to Guillaume Gibieuf makes this distinction clear.

> Here we have to recall the rule already stated, that we cannot have any knowledge of things except by the ideas we conceive of them. . . . Thus we have no reason to affirm that there is no mountain without a valley, except that we see that the ideas of these things cannot be

> complete when we consider them apart; though of course by abstraction we can obtain the idea of a mountain, or of an upward slope, without considering that the same slope can be traveled downhill. (AT 3:476–77; CSMK 202)

Thus, an idea of the mountain alone is formed merely by abstracting the mountain from the richer idea of mountain-valley. On this basis we can have no positive grounds for establishing the mountain as an entity in its own right, as a complete thing known adequately (also see AT 4:220; CSMK 236; AT 7:221–22; CSM 2:155–56). Abstraction simply concentrates on one feature of a thing at a time, while holding in abeyance, at the same time, its other features. So abstraction never grasps anything as a complete whole. Moreover, abstraction fails to provide, as such, means for distinguishing essential from inessential features. Thus, although in abstracting we move from the general to the more general (AT 10:458; CSM 1:69), something is lost since the content is always less than the basis from which it is derived. In contrast, an adequate concept possesses epistemic content beyond what is present in that to which it refers. As we'll see, Descartes's handling of innate ideas accounts for this important epistemic requirement.

As we have seen in chapter 1, by the time of the *Discourse* (1637) Descartes has worked out a principled account of the nature of mental substance that can exist independently of any material thing (AT 6:33; CSM 1:127). In other words, he now claims that the nature and existence of mental substance is known directly in complete exclusion from that of bodily substance. However, by the time of the *Principles*, our way of knowing the mental and its principal attribute will be stressed even more strongly. This forces him to rethink the nature and status of innate ideas, and they begin to move, in the post-*Meditation* period, to center stage in his thought. The present chapter will investigate the stages involved in this shift.

Intuition and Enumeration

It is no surprise that Descartes's conception of the mind and its contents undergo significant development over time. In Rule 12, he simply posits a distinction between mind and body, offering little explanation of what the mind is, what the body is, how body is informed by mind, or how they act upon one another. Rule 9 tells us: "We should turn . . . to the things themselves; and we should deal with those only in so far as they are within the reach of the intellect. In that respect we divide them into absolutely simple and complex or composite natures. Simple natures

must all be either spiritual or corporeal, or belong to each of these categories" (AT 10:399; CSM 1:32). The mind is, of course, "one single power" and the "power through which we know things." Despite the apparent limitation suggested by "only in so far as they are within the reach of the intellect," Descartes, at this point, thinks the intellect has the power to grasp real natures. Moreover, it is a "purely spiritual" power and "no less distinct from the whole body than blood from bone, or the hand from the eye." In a sketchy fashion we are told that the "cognitive power" of the mind in all its functions "is sometimes passive, sometimes active: it resembles sometimes the seal, sometimes the wax. But here [as opposed to the literal appeal he makes to the seal earlier in this rule] this is to be taken merely as an analogy, for nothing quite like this power is found in corporeal things" (AT 10:415; CSM 1:42). Descartes defines "intuition" as "the conceptual act of the pure and attentive mind" that "springs from the light of reason alone." By means of this purely mental operation "everybody can mentally intuit that he exists, that he is thinking, that a triangle is bounded by three lines, that a sphere is bounded by a single surface and the like" (ibid. 369; 14). In each case, what is being intuited is a simple nature.

Rule 12 nicely illustrates what Descartes means by simple natures. Invoking the distinction between the *ordo cognoscendi* and *ordo essendi*, he tells us that we need to consider corporeal objects otherwise than how "they really exist." For example, an extended body is something "single and simple, because it cannot . . . be said to be a composite of the nature of body, of extension, and of shape, since these parts have never existed separately from each other; none the less, with respect to our intellect, we do call it something composite, something composed of these three natures, because we have understood each of them separately before we are able to judge that the three of them are found together in one and the same subject" (ibid. 418; 44). Shape, extension, and so on, are simple natures because (*a*) they cannot be "divided by the mind into more things known more distinctly"; (*b*) because they are that out of which bodily things are composed; and (*c*) they are the objects of intellectual intuition. He specifies further by saying that the things said to be "simple" with respect to our intellect are either purely intellectual or purely material or common to both. Purely intellectual are those things "which are known by the intellect through a certain innate light, without the aid of any corporeal image. That there is a number of such things is certain: it is impossible to feign any corporeal idea which could represent for us what knowledge is, what ignorance is; and the same holds for what an act of will is, which may be called 'volition,' and for similar things; yet we really do know all these things, and so easily do we do so, that it suffices, for doing so, that we participate in reason" (ibid. 418; 44). For Descartes at this

stage, it "is not possible for us ever to understand anything beyond those simple natures and a certain mixture or compounding of one with another" (AT 10:422; CSM 1:46).

In saying there are things known intellectually by a "certain innate light" Descartes is referring to the action of the *vis cognoscens*, which exhibits two innate powers: The first is the acts of intellectual intuition that we have been discussing, and the second is deduction or inference, which is the power of moving, by an uninterrupted sequence of self-evident steps, from the premises to the conclusion. In Rule 6 we are told that deduction is supplementary to intuition insofar as its certainty is based on simple natures that can only be grasped by intuition. Furthermore, the act of deduction, the illation from one premise to another, depends on apprehending that one implies the other; that is, it depends on an intellectual intuition that apprehends the connection between the premises. These powers express the very nature of the intellect itself and are presupposed when we are establishing knowledge. Descartes tells us in Rule 4: "Unless our intellect were already able to use them, it could not understand any of the precepts of the very method itself, not even the simplest precept" (AT 10:372; CSM 1:16). Thus in the *Rules* Descartes is concerned with what can be established by the "innate" natural light of the mind when it focuses attentively on a subject matter: and its agenda is one of isolating simple natures and distinguishing them from the composite natures they compose. However, we must not forget the distinction between the *ordo essendi* and the *ordo cognoscendi*. Rule 12 distinguishes between simple natures, as they really are and as they are present to thought as ideas. In the order of knowledge, simple natures are called "primitive notions." They are not, however, extramental entities. Nevertheless, considered as simple natures that the mind intuits, for Descartes they represent material reality, that is, genuine features of what there is in the world. In other words, the order of knowing (*ordo cognoscendi*) maps onto the way things really are (*ordo essendi*). But this will change. By the time of the *Principles* Descartes no longer believes we can intuit the simple natures of material things.

But there are also other simples in the mind "termed 'common' which are ascribed indifferently, now to corporeal things, now to spirits . . . for instance, existence, unity, duration and the like. To this class we must also refer those common notions which are, as it were, links that connect other simple natures together, and whose self-evidence is the basis for all the rational inferences we make. Examples of these are: 'Things that are the same as a third thing are the same as each other'; 'Things that cannot be related in the same way to a third thing are different in some respect' " (ibid. 419; 5). These notions are innate in the mind. So too are things between which there are necessary connections: "If, for example, Socrates

says that he doubts everything, it necessarily follows that he understands at least that he is doubting, and hence that he knows that something can be true or false, etc., for there is a necessary connection between these facts and the nature of doubt." This is also the case concerning propositions such as "I am, therefore, God exists" or "I understand, therefore I have a mind distinct from my body" (ibid. 422; 46).

Clearly, Descartes posits innate faculties and innate common notions, yet he makes no mention of *innate ideas*. It's important to notice, however, that in the *Rules*, he still thinks in terms of an ontology of simple natures and not in terms of an ontology of substance. Indeed, he has yet to conceive the real distinction between mind and body. And insofar as he has an account of sense perception, this gets expressed in terms of the intuitive apprehension of simple natures to the extent they are establishable through mental and sensory experience. We see this clearly in Rule 6, where Descartes makes a distinction between what is simplest, the *absolutes* and those that are *relative*. The *absolute* "is whatever has within it the pure and simple natures in question; that is, whatever is viewed as being independent, a cause, a simple, universal, single, equal, similar, straight, and other qualities of that sort," whereas the *relative* "is what shares the same nature, or at least something of the same nature, in virtue of which we can relate it to the absolute and deduce it from the absolute in a definite series of steps" (AT 10:382; CSM 1:21). Descartes warns that in terms of this distinction "there are very few pure and simple natures which we can intuit straight off and *per se* (independently of any others) either in our sensory experience or by means of a light innate within us. We should, as I said, attend carefully to the simple natures which can be intuited in this way, for these are the ones which in each series we term simple in the highest degree. As for all the other natures, we can apprehend them only by deducing them from those which are simple in the highest degree" (AT 10:383; CSM 1:22). What is important here, as Descartes emphasizes in Rule 11, is that in the act of intuiting an object, the object is not apprehended part by part, or successively, but as a whole and simultaneously (AT 10:407; CSM 1:37).

But what is the role of sensory experience in this process of reasoning? The mind must start from knowledge that depends upon our senses or our imagination, and by reasoning according to the method of the *Rules*, develop and expand the knowledge from which it starts. Thus, Descartes insists that a sensuous, or at least an imaginative, basis is a prerequisite of all reasoning; that prior to all deductive reasoning there must be present to the mind knowledge of certain "data," or, as Descartes calls them, "certain kinds of being" or certain "natures." The empirical bent of the *Rules* is nowhere more evident than in Rule 14, which we analyzed in chapter 1, but repeat in part here. Descartes states:

> For example, if someone is blind from birth, we should not expect to be able by force of argument to get him to have true ideas of colors just like the ones we have, derived as they are from the senses. But if someone at the same time has seen the primary colors, though not the secondary or mixed colors, then by means of a deduction of sorts it is possible for him to form images even of those he has not seen, in virtue of their similarity to those he has seen. (AT 10:438–39; CSM 1:36–37)

A process of pure reasoning cannot reveal a new kind of being, since this would demand we were endowed with "a new kind of sense or a divine intellect." We are bound to the world of experience, and if the mind is to reason, it must start from a "nature" that is already known to us in virtue of an entity presented to us by the senses or represented to us by the imagination. Descartes's claim that it is impossible to make a man, blind from birth, perceive the true nature of the colors by mere force of reasoning is very telling. In the *Rules*, he is clear that we can only derive ideas of color from the senses. But in the *Notes on a Certain Program* (1648) he says that even the ideas of color are innate (AT 8.2:359; CSM 1:304). Clearly, a significant shift has taken place, which we will discuss shortly.

Ideas and Descartes's New Theory of Mind

With the publication of *Discourse on the Method* (1637), Descartes begins to strike out in a more metaphysical direction. Parts IV and V discuss ideas of God, the soul, the cogito, and the notion of "certain laws" that God "has implanted . . . in our minds" (AT 6:31–44; CSM 1:126–33). Descartes argues that although the senses may deceive him, and although he is prone to the vagaries of illusion, nevertheless the act of thinking itself, quite independently of the senses, confirms the necessity of his existing, and of his being something. From this, he concludes immediately that he is "a substance whose whole essence or nature is simply to think" and that the "soul by which I am what I am. . . is entirely distinct from the body, and indeed is easier to know than the body, and would not fail to be whatever it is, even if the body did not exist" (ibid. 33; 127; on the cogito see letter to Silhon of May 1637 and to Pollot, April 1638). Clearly, Descartes thinks that the cogito and the idea that his soul is distinct from, and better known than, his body, are ideas innate to the mind whose origin does not lie with the senses. But he also thinks that the cogito establishes an idea that is certain and true because he sees "very clearly that in order to think it is necessary to exist." On the basis of this truth, he puts forth for the first time his rule of truth, namely, the "general rule that the things we conceive very clearly and very distinctly are all true" (ibid. 33; 127).

Descartes next concludes that since he can think of something more perfect than his nature, that this idea has "to come from some nature that [is] in fact more perfect." If the idea of a more perfect being than he cannot come from his own inferior nature, since the more perfect can't arise from the less perfect, and if it manifestly can't come from nothing, "there remained only the possibility that the idea had been put into me by a nature truly more perfect than I was and even possessing in itself all the perfections of which I could have any idea, that is—to explain myself in one word—by God" (ibid. 34; 128) This is not just any innate idea. It is the idea of a perfect being implanted in the mind by God and, upon mental inspection, found to include existence "in the same way as—or even more evidently than—the idea of a triangle includes the equality of its three angles to two right angles. . . . Thus I concluded that it is at least as certain as any geometrical proof that God, who is this perfect being, is or exists" (ibid. 34; 128). On basis of establishing the existence of these innate ideas, Descartes argues that the Scholastic philosophers were wrong to hold that nothing is in the intellect not previously in the senses, for "it is certain that the ideas of God and of the soul have never been in the senses."

In Part V, he says that among the ideas innate in us are "certain laws which God has so established in nature, and of which he has implanted such notions in our minds, that after adequate reflection we cannot doubt that they are exactly observed in everything which exists or occurs in the world" (ibid. 41; 131). These laws are the laws of nature of *The World* and Descartes observes that they follow from God's perfection (ibid. 42; 132). Clearly, by the time of the *Discourse* Descartes has in place part of his metaphysics of ideas.

Consideration of the *Objections* to the *Meditations* (1641) leads Descartes to reconsider what he had written there. This is evident in the way he develops his conception of substance from the *Meditations* to the *Principles*. In the *Meditations* he has not yet established a settled view of the nature of substance, and even later in the *Principles* there remains an apparent tension between substance identified with what Descartes now calls its principal attribute and substance viewed as a substrate in which its attributes and modes inhere. According to the first conception, thought, thinking substance, and mind are identical: according to the second, thought constitutes or defines the essence or nature of thinking substance. This second view is what seems to be confirmed in the *Second Reply*: "Everything in which there immediately inheres, as in a subject, or through which there exists, something we perceive (that is, some property, or quality, or attribute whose real idea is in us) is called a 'substance' " (AT 7:161; CSM 2:114). Later Descartes speaks of the substratum view in a different manner, in *Principles* I, article 52: "we cannot

initially become aware of a substance merely through its being an existing thing . . . [but] if we perceive the presence of some attribute, we can infer (*concludimus*) that there must also be present an existing thing or substance to which it may be attributed" (AT 8.1:25; CSM 2:210). This difference is elaborated in *Principles* I, article 63: "Thought and extension can be regarded (*spectari possunt*) as constituting the natures of intelligent substance and corporeal substance (*substantiae intelligentis & corporeae*); they must then be considered (*concipi debent*) as nothing other than thinking substance itself and extended substance itself—that is, as mind and body. In this way we will have a very clear and very distinct understanding of them. Indeed, it is much easier for us to have an understanding of extended substance or thinking substance than it is for us to understand substance on its own (*substantiam solam*), leaving out the fact that it [the substance] thinks or is extended" (ibid. 31; 215).

Notice the verbal expressions "can be regarded" and "must be considered." These clearly refer to how, given our cognitive abilities, we may conceive of a substance in order to have a very clear and distinct idea of it. From this perspective we can make a conceptual distinction between the substance and what we understand to be its defining attribute: that is, we can make "a distinction between a substance and some attribute of that substance without which the substance is unintelligible" (ibid. I.62; 30; 214). But what we cannot do is conceive the substance itself: it is known to us only through its principal attribute. This view was foreshadowed in the later *Replies*: "We do not have immediate knowledge of substances, as I have noted elsewhere. We know them only by perceiving certain forms or attributes which must inhere in something if they are to exist; and we call the thing in which they inhere a 'substance' " (*Fourth Reply*; AT 7:222; CSM 2:156). Admittedly, here there is an ambiguous imprecision in Descartes's position, which may be deliberate on his part. Nevertheless, a thread runs through his view of substance in this period that is captured in a letter to Gibieuf in January 1642: "I do not deny that there can be in the soul and the body many properties of which I have no ideas; I only deny that there are any which are inconsistent with the ideas I do have, including the idea that I have of their distinctness; for otherwise God would be a deceiver and we would have no rule to make us certain of the truth" (AT 3:478; CSMK 203). These ideas of inconsistency as the test of clarity and ideas as rules, he will develop more fully later. At this point, he is only beginning to develop his epistemic conception of the distinction between a substance and its principal attribute, which are ideas that we use as rules to make substance intelligible to ourselves. Thus, our ideas do not exhaust the nature of substance itself.

We come now to Descartes's understanding of the terms "thought" and "idea." In the geometrical appendix to the *Second Reply* he defines

"thought": "I use this term to include everything that is within us in such a way that we are immediately aware of it. Thus all the operations of the will, the intellect, the imagination and the senses are thoughts" (AT 7:160; CSM 2:113; see also *Principles* I.9; AT 8.1:7; CSM 1:195). The term "idea" we are told means "the form of any given thought, immediate perception of which makes me aware of the thought" (ibid. 160; 113). For example, sensory ideas exist "only in so far as they give form to the mind itself, when it is directed towards that part of the brain" (ibid.). Note the unmistakable intentionality Descartes builds into the conception of idea as the *form* of a sensory thought, a notion we will examine thoroughly in the next chapter. And notice also his rejection of the notion that ideas equate with images. Descartes holds that ideas are of different kinds. Some ideas are of material bodies, and Thomas Hobbes (the third objector) thinks all ideas are of this kind. But Descartes also holds there are other kinds of ideas that do not have material objects as their content. The idea of God, soul, volition, and the common notions are ideas of this kind.

This leads him to dismiss Hobbes's view that the term "idea" must be taken "to refer simply to the images of material things which are depicted in the corporeal imagination . . . and cannot be used to refer to God." (The reference to *Meditation* III is AT 7:37; CSM 2:25). Descartes emphasizes that he takes "the word 'idea" to refer to whatever is immediately perceived by the mind. For example, when I want something, or am afraid of something, I simultaneously perceive what I want, or am afraid; and this is why I count volition and fear among my ideas. I use the word 'idea' because it was the standard philosophical term used to refer to the forms of perception belonging to the divine mind, even though we recognize that God does not possess any corporeal imagination. And besides, there was not any more appropriate term at my disposal" (ibid. 181; 128). Descartes suggests that our ideas, like God's, are mental acts, contents, and concepts, and assuredly are not always images, as Hobbes and Gassendi proclaim (see Ariew 1998, 65). Descartes makes similar comments to Mersenne in July 1641, while replying to an unknown correspondent who is puzzled by what he means by the idea of God. He points out that imagining is not "the only way we have of thinking and conceiving," so that however we conceive of God, "we have an idea of Him." Thus, he says that the correspondent will "understand what I mean by the idea of God if he takes the word 'idea' in the ways in which I said explicitly that I took it, and [which] is not to be confused by those who restrict it to the images of material things formed in the imagination" (AT 3:393; CSMK 185).

Notice, in his reply to Hobbes, that Descartes equates certain kinds of ideas with "the forms of perception belonging to the Divine mind" (ibid.). This suggests that he views these ideas as mental acts whose contents

comport to something, but not to something material. But why does he appeal to divine ideas as a model by which to understand ideas? Recall his ongoing aim of separating ideas from sense, and of stressing the priority of the mind's perfections over the body's. Thus, divine ideas provide an ideal model to which Descartes can appeal, since they allow him, in articulating the ontic status ideas possess in human conception, to analogize them with respect to the incorporeality of the divine mind that thinks without sensing, that is, without corporeal images. Thus, in appealing to ideas in God's mind, Descartes liberates ideas, as mental entities, from their traditional association with sensations and corporeal images (Ariew 1999, 74–75). This entails a notable and important shift away from the *Rules*. In the earlier treatise, the basic epistemic act is one of abstracting simple natures as given in experience. In the *Discourse*, *Meditations*, and *Principles*, clear and distinct ideas, "objects" of the mind alone, are substituted for sensory intuitions and abstractions. Roger Ariew advances an interesting reason for this shift: Descartes's transformation of the term "idea" liberates it from the complex ontologies of form and matter. Thus, the term "idea" becomes, as a result, a unit of thought directed immediately to its object, whatever that object may be, and consequently the term is no longer tied to the methodology of abstraction as it connects with the operations of the passive and active intellect. Furthermore, in perceptual contexts it is no longer tied to the ontology of substantial forms and real qualities (Ariew 1999, 75–76).

As Ariew has pointed out, Descartes is well aware of the tradition of exemplary causation, according to which idea is identified with an exemplar, from his knowledge of the works of Eustachius, Goclenius, and De Raconis (ibid.). In this tradition, which stems largely from Platonic roots, ideas are models or archetypes for creation whether the creative agent is divine or human. Ariew notes that Descartes uses the term "archetype" once, in *Meditation* III, in explaining how ideas, though caused by other ideas, must ultimately, on the pain of regress, be caused by a primary idea "which is a likeness of the archetype (*instar archetypi*) in which as much formal reality is contained as there is objective reality in the idea" (AT 7:42; CSM 2:29). For Ariew, this use of "archetype" doesn't necessarily indicate Descartes's acceptance of metaphysical exemplarism, that is, the claim that things are copies of ideas in the divine mind, the latter conceived as models to which they conform (1999, 73). As we point out in chapter 3, Descartes's strict view of the ontological simplicity of divine nature leaves no room for the exemplarist notion that the divine mind possesses ideas to which created things conform.

Ariew makes an interesting observation in this connection. He refers to Descartes's reversal of the relationship between idea and thing. In place of the view that ideas serve as models to which things conform, Descartes

conceives them as mental acts and contents, which function "as a vehicle for conformity *to* things rather than, conversely, as the standard to which things conform" (1999, 75). Ariew is right to point out that Descartes's major transformation of the concept of idea is to construe it as a mental item that conforms to things. This does not demote ideas. On the contrary, it stresses the active role they play as the forms of thought through which we grasp the representative content necessary to understand experience.

It's important to point out that Cartesian ideas have a dual aspect: they are at once acts of thinking and the content of what is thought of qua object of thought. That is, according to Descartes's conception, ideas have both formal and objective reality. In *Meditation* III, the distinction is introduced prior to the first argument for God's existence. Asking whether certain ideas refer to things existing outside him, Descartes says: "insofar as these ideas are merely modes of thought, I see no inequality among them; they all seem to proceed from me in the same manner. But insofar as one idea represents (*repraesentat*) one thing and another idea another thing, it is obvious that they do differ very greatly from one another. Unquestionably, those ideas that display substances to me are something more and, if I may say so, contain within themselves more objective reality (*realitatis objectivae*) than those which represent only modes or accidents" (AT 7:40; CSM 2:40). Here, and elsewhere, Descartes appeals to two distinct realities in one idea: the formal reality, or the idea considered in its psychological character as a cognitive and representing mode of the mind; and the objective reality, the idea in regard to the representative character of its content, that is, what it is directed toward. The cause of an idea's formal reality is the mind itself, insofar as it's a mode of mind. But insofar as the representative content of an idea is different from other ideas, this must, in Descartes's view, be accounted for causally. Thus, for him, the objective content of an idea must have as its cause a real being that possesses at least as much perfection, either formally or eminently, as the content of the idea represents. Moreover, for Descartes, the content of an idea is itself an *esse*, and, as such, it too must have a place in the causal order. Thus, for him, "the mode of being by which a thing exists objectively in the intellect by way of an idea . . . is certainly not nothing (*non—-nihil est*), and so it cannot come from nothing" (AT 7:41; CSM 2:29). Descartes's double negative is misleading, since it seems he is drawing a contrast between being and nonbeing. His aim, rather, is to maintain, like the Scotists, that the objective content of an idea, though it is a low grade of being, still requires a causal source (Wells 1990, 40–45).

Caterus queries this claim in the *First Objection*, since it does not square with standard Scholastic doctrine. He objects: "On the contrary, this [the idea's content] requires no cause; for objective reality is a pure label, not anything actual. A cause imparts some real and actual influence;

but what does not actually exist cannot take on anything, and so does not receive or require any actual influence" (AT 7:93; CSM 2:67). This reflects the Scholastic view that the reality of an idea is its formal reality, by which it possesses a representative character by its very nature, so that no new reality is added to it. In other words, the representative character of an idea is only conceptually distinct from it. This means that it is merely a conceptual entity in the mind, so that consequently the *esse objectivum* is not really distinct from the *esse formale*. Thus, the Scholastics speak of the *esse intentionale* or the *esse objectivum*, but they never call the objective content of an idea a *realitas objectiva*. Insofar as the *esse* of an idea is at issue, it is called real only on analogy to the actual existence that objects have outside the mind. In his reply, Descartes does not address the challenge to his claim that the objective reality of an idea is an *esse* although admittedly an *esse* with a diminished form of being. He simply reasserts his view that the idea "needs a cause enabling it to be conceived, which is the sole point at issue" (ibid. 104 and 75; see also Armogathe 1995; Wells 19901; Verbeek 1995; Normore 1986).

This distinction, namely, that ideas are both acts of thinking and what is thought of qua object of thought, and the jargon Descartes uses to state it, are found in Suárez, Eustachius, and Goclenius. For example, Goclenius states, "The formal concept is that which we form concerning something apprehended by the intellect. The objective concept is the thing which is conceived insofar as it is the object of our formal concept" (1613, 427). In Eustachius we find that " 'to be objectively in the intellect' is nothing else than to be actually present as an object to the knowing intellect, whether what is present as an object of knowledge has true being within or outside the intellect, or not." He goes on to say that "certain items have no other being apart from objective being, or being known by the intellect: these are called 'entities of reason' " (1609, First Part, tract 1, Disput. 2, question 3, 10–11). It is Suárez who provides the most detailed discussion of the related distinctions between formal and objective concepts, and formal and objective existence. He considers "the common distinction between a formal and an objective concept," and tells us that "a formal concept is said to be the act itself . . . or the word whereby the intellect conceives some thing or common definition" (DM 2.1.1, 1:64–65). It is called a concept because it is the "offspring of the mind," and it is called formal "either because it is the ultimate form of the mind, or because it represents formally to the mind the thing that is known, or because it really is the intrinsic and formal term of the mental conception, thus differing from an objective concept" (ibid.). Thus a formal concept is a mental entity in the sense that it is "a form intrinsically determining a conception." It is clear that Suárez's definitions are relevant to Descartes's manner of characterizing ideas as being in the mind intrinsically that is,

formally, according to the mind's proper modes of conceiving. According to Suárez an objective concept differs from a formal concept, in that "it is said to be the thing, or notion which is strictly and immediately known or represented by means of the formal concept. For example, when we conceive of a man, that act which we perform in the mind in order to conceive of the man is called a formal concept; but the man thus known and represented by the act is called the objective concept. As a concept, it is so called through a denomination that is extrinsic to the formal concept through which its object is said to be conceived; and hence it is rightly called objective" (ibid. 65). Thus, the "objective reality" of an idea or concept is derived from the idea's formal reality for Suárez, but unlike Descartes he does not construe its content as an *esse*. Furthermore, according to Suárez, an "objective" concept is not a concept "in the sense of a form intrinsically determining a conception, but in the sense of the object and subject matter round which the formal conception is deployed, and to which the mind's eye moves: in view of which it is called by some, following Averroes, the intention formed by the intellect, and by others the objective relation" (ibid. 65). In other words, if something has objective reality in the mind, it stands to the mind as the immediate "object" or the content of its representation or awareness. The object may have intentional in-existence as a "true and immutable nature," or it may have extramental existence as the object behind a given perception. For Suárez, a formal concept is always a "true and positive thing," a characteristic not always true of an objective concept, since the mind can entertain privations that have "being only objectively in the intellect" (ibid.). Again, formal concepts are always singular and individual, whereas "an objective concept can indeed sometimes be a singular and individual thing, insofar as it can be presented to the mind and conceived by a formal act, but often it is a something universal, or confused and common, such as 'man,' 'substance,' and so on" (ibid.).

Innate Ideas

Descartes makes distinctions among kinds of ideas in a letter to Mersenne on June 16, 1641: "I use the word 'idea' to mean everything which can be in our thought, and I distinguish three kinds. Some are adventitious, such as the idea we commonly have of the sun; others are constructed or factitious, in which class we can put the idea which astronomers construct of the sun by their reasoning; and others are innate, such as the idea of God, mind, body, triangle, and in general all those which represent true, immutable and eternal essences" (AT 3:383; CSMK 183). This account is similar to what Descartes writes in *Meditation* III (AT 7:38; CSM 2:26)

and is also repeated, as late as April 1649, in a letter to Claude Clerselier (AT 5:354; CSMK 376). But in a 1641 letter he goes on to make an important distinction between constructed ideas and innate ideas that he does not make fully explicit in the *Meditations*, though *Meditations* III and V rely heavily on this feature of innate ideas in proving the existence of God. With respect to an innate idea, I can "draw out . . . something which was implicitly contained in it but which I did not at first notice in it. Thus, I can draw out from the idea of triangle that its three angles equal two right angles, and from the idea of God that he exists. This method of arguing does not apply to constructed ideas, since in making explicit what's in them I simply affirm what I put in them initially" (ibid. 383; 183). The act of "drawing out" from an idea is at the core of the method of exclusion that supplants Descartes's reliance on abstraction. We have talked about this before, and shall have occasion to revisit the topic again.

Adventitious ideas have a number of characteristics: their origin appears to lie beyond the mind in that their occurrence is separate from the action of the will, for example, situations in which we feel heat whether we want to or not (AT 7:38–39; CSM 2:7). But it by no means follows that adventitious ideas "must resemble those things." So it seems to be the case, Descartes goes on to say, that "I have frequently noticed a vast difference in many cases" (AT 7:39; CSM 2:22). By way of example, he articulates two different ideas of the sun that he finds within himself. The one acquired by the senses and taken to come from an external source makes the sun appear very small; the other, constructed by astronomical principles, indicates that the sun is many times larger than the earth. Both ideas can't be true ideas of the sun as it really is, and the force of reason persuades Descartes that his sensory idea that he takes to emanate from the sun itself doesn't in fact resemble it (ibid.).

Descartes also gives a more general division of ideas: there are ideas that are "as it were images of things . . . for, example, when I think of a man, or a chimera, or the sky, or an angel, or God" (ibid. 37; 25). Other ideas have a different form: for example, willing, affirming, denying, or being afraid. He adds that thoughts, volitions, emotions, and judgments include "something more than the likeness" of a thing. They are in fact ideas that take mental acts as their objects, and we become aware of the activity of the mind by reflecting on such thoughts.

The category of judgments calls for special attention. Ideas, considered in themselves, do not mislead. Whether I imagine an actual or a fictitious object, what I imagine is real as imagination; similarly in regard to acts of willing or desiring. Whether what I desire is actual or not does not make less true that I desire it. But in judging that "ideas which are in me resemble, or conform to, things located outside me" (ibid. 37; 25), I can

easily be deceived, suffer illusion, or fall prey to forms of misperception, and consequently may fall into error.

In the *Rules* and *The World* Descartes, by means of intuition and abstraction, seeks to establish the ultimate features of things as they are in themselves; that is, he seeks to establish an objective ontology of natures that compose material bodies. He makes the point in the geometrical appendix to the *Second Reply* that those who attend to the mind will find self-evident propositions "within themselves, such as 'The same thing cannot both be and not be at the same time' " (AT 7:163; CSM 2:115). The way he states his position in the *Principles* is that all "the objects of our perceptions we regard either as things or affections of things, or as eternal truths which have no existence outside our thought" (AT 8.1:23; CSM 1:208). Material modes are referred to extended substance, and mental modes to thinking substance, and all fall under duration, existence, and order. Causal principles such as "Nothing comes from nothing" are classed as common notions or eternal truths, and the ideas of the eternal truths reside in the mind, having been implanted there by God (ibid. 24 and 209). In summing up his view in article 75 of the *Principles* Descartes says that "we must give our attention in an orderly way to the notions that we have within us (*quas ipsimet in nobis habemus*), and we must judge to be true all and only those whose truth we clearly and distinctly recognize when we attend to them in this way. When we do this we shall realize, first of all, that we exist in so far as our nature consists in thinking; and we shall simultaneously realize both that there is a God, and that we depend on him, and also that a consideration of his attributes enables us to investigate the truth of other things, since he is their cause. Finally, we shall see that besides the notions of God and of our mind, we have within us knowledge of many propositions which are eternally true, such as 'Nothing comes from nothing' " (ibid. 38; 221).

Let's be clear about what has changed. We are not claiming that in the *Rules* and in *The World* Descartes denies the innate existence of certain sorts of ideas in the mind. Recall he said that "everybody can mentally intuit that he exists, that he is thinking, that a triangle is bounded by three lines, that a sphere is bounded by a single surface and the like" (ibid. 369; 14). He also supposes that the mind has an innate ability to intuit the ultimate natures of things by a method of abstraction. And earlier in 1630 in letters to Mersenne, he argues that eternal truths are implanted in us by God (see chapter 2). In the *Meditations* and in his later writings, however, the number and function of innate ideas is changed. Central to Descartes's late position is the conception that the mind is furnished with a stock of innate ideas that the mind brings to bear on particular experiences. Simply put, the difference is this: in the *Rules* he emphasizes the mind's power to discover essences in the form of simple natures of things.

It does so by abstracting the general from the particular as it is given by experience. In the *Meditations* and *Replies*, and later in the *Principles*, he emphasizes the necessity that ideas must be already available in the mind and function as rules by which we understand our experience. But being available to the mind does not mean being present fully fledged in the mind from birth. As Descartes writes in the *Principles* I.47: "In our childhood the mind was so immersed in the body that although there was much that it perceived clearly, it never perceived anything distinctly. But in spite of this the mind made judgments about many things, and this is the origin of the many preconceived opinions which most of us never subsequently abandon" (AT 8.1:22; CSM 1:208).

We noted above Descartes's observation that he is able to "draw out" consequences from ideas that he had not noticed previously. In other words, he claims that in acts of reflection we can become aware of further features of ideas that are within us. This is the view that ideas are implicit in our inner experience, or consciousness of ourselves, toward which our attention is not necessarily directed and upon which we may never reflect. This notion of innateness is not to be confused with the claim that ideas are stored in the mind from birth. Moreover, it is one that we encountered previously in our discussion of the implications of the cogito in chapter 3. In *Meditation* III, Descartes says that his "understanding of what a thing is (*quid fit res*), what truth is (*quid fit veritas*) and what thought is, seems to have no source other than my own nature (*ipsamet mea natura*)" (AT 7:38; CSM 2:28). Here Descartes cites three ideas present innately—"thing," "truth," and "thought"—all of which are operative in the context of executing the cogito argument. In *Meditation* II he concludes that "I am, I exist" is necessarily true each time it is asserted or conceived. This prompts the realization that he is "A thing that thinks" (*res cogitans*), that is, that he is in "the strict sense only a thing that thinks, that is, a mind, or intelligence, or intellect, or reason, words whose significance I have previously ignored" (AT 7:28, 27; CSM 2:18, 19). This realization is derived wholly and immediately from reflection on the nature of the cogito. Thus two innate ideas are involved in thinking the cogito at this point: "thing" and "thought." Realization that "truth" is also involved occurs at the beginning of *Meditation* II. Descartes asks "whether there may be other things within me which I have not yet noticed. I am certain that I am a thinking thing. But do I not also know what is required for me to be certain about anything." This in turn leads him to apprehend the rule "that everything which is very clearly and distinctly perceived is true" (AT 7:35; CSM 2:24). McRae points out that further ideas are drawn out by Descartes from reflection on the cogito; for example, he sees that his awareness of imperfections in his nature presupposes the idea of a perfect being (1972b, 36). It is important to notice that Descartes, in the act of

thinking the cogito, is considering a unique and highly specific innate idea—that is, that it is impossible for a self that is thinking not to exist. It is only upon further reflection that the cogitator grasps explicitly that concepts such as thought, thing, truth, and existence are primitively involved in performing the cogito. It is clear for Descartes that these ideas are accessible to the mind prior to its first act of thinking them. They are innate in that they are grasped by the mind when it reflects on what it has experienced already when it thinks; that is, they are implicit in our experience of ourselves as thinking. In other words these ideas are not prior to experience. Their priority consists only in their being presuppositions that form the basis for a reflective grasp of concepts such as "thought," "thing," "existence," "truth," and "God." This is precisely what Descartes has in mind in *Principles* I.10 when he states that what is self-evident is only obscured by giving definitions. The same is true of the innate idea of God. We become aware of it on contemplating the finite nature of our existence. Notice that these reflective acts do not depend on generalizations from abstraction. The mind grasps reflectively and positively both (*a*) what is included in and excluded from the structure of the thought that it thinks and (*b*) what is involved when it considers the finitude of its existence.

In the *Fifth Meditation*, Descartes considers an inventory of ideas, insofar as they exist in his thought, to see which are distinct and which confused. Primary among the ideas he considers is externally existing material objects. He notes that he distinctly imagines quantity, that is, "continuous quantity" or extension, its parts and their modes of size, shape, and position, as well as local motions and duration. He says he grasps not only these general and universal ideas, but "in addition there are countless particular features regarding shape, number, motion and so on, which I perceive when I focus my attention on them" (AT 7:63; CSM 2:44). He goes on to say that "Their truth is so open and so much in accord with my nature that, when I first discover them, it seems I am not so much learning something new as recalling something I knew beforehand. In other words, it seems as though I am noticing things for the first time that were in fact in me for a long while, although I had not previously directed a mental gaze upon them" (ibid. 64; 35). The allusion to the Platonic notion of ideas awakened in us by experience and memory (anamnesis) is unmistakable. But something more is involved. Just as in the case of the ideas of the cogito, the self, and God, Descartes is maintaining that he knows about material objects quite independently of knowing whether they exist. At this point in his meditation he is unable to prove the existence of the physical world. Nevertheless, he is certain that he has a clear and distinct idea of material things. Accordingly, we can say that Descartes believes we have innate ideas that pertain to material

objects. It is well to note here that his position is at odds with his Scholastic contemporaries. Contrary to their general belief, Descartes holds that "we must never ask *if* it is (*an est*) until we first understand *what* it is (*quid est*)" (AT 7:108; CSM 2:78). For the Scholastics, on the contrary, we grasp what something is just in case we are able to abstract it from the existing thing itself.

This raises a key question: do we have an innate idea of particular things that they exist? It seems that we do not prior to encountering them in sensory experience. In the causal realist argument of *Meditation* VI Descartes tells us that God has given us a very strong natural inclination to believe that ideas of corporeal things are caused by corporeal things themselves, since it is difficult to see "how God could be understood to be anything but a deceiver if the ideas were transmitted from a source other than corporeal things. It follows that corporeal things exist . . . and at least they possess all the properties which I clearly and distinctly understand, that is, all those which, viewed in general terms, are comprised within the subject matter of pure mathematics" (AT 7:89; CSM 2:55). Thus, the extension to which Descartes here refers is the general property of extension that is known by the mind but may be visualized or imagined when applied to corporeal objects (Wilson 1999a, 28–29). And this act of mind differs from pure understanding in that "when the mind understands, it in some way turns towards itself and inspects one of the ideas which are within it; but when it imagines, it turns towards the body and looks at something in the body which conforms to an idea understood by the mind or perceived by the senses. I can, as I say, easily understand that this is how imagination comes about, if the body exists" (AT 7:73; CSM 2:51). Since we can clearly and distinctly conceive prior to experience that corporeal things are extended, and further we may reason that they can be divided and augmented into countless possible parts, we can establish demonstrative knowledge of relationships and properties among these various parts, the source and validity of which lies within the powers of the mind alone. In short, geometrical knowledge of extended things is innate.

Meditation V brings out vividly Descartes's commitment to innateness. He tells us that there are things in himself on which he has never turned his "mental gaze . . . before" (ibid. 64; 35), which are not his invention and which possess "their own true and immutable natures." For example, "when I image a triangle, even if perhaps no such figure exists outside my thought anywhere in the world and never has, the triangle still has a certain determinate nature, essence, or form which is unchangeable and eternal which I did not fabricate, and which does not depend on my mind" (AT 7:62; CSM 2:36). Thus, the content of the idea of a triangle in general, even though it may lack physical existence, is a determinate nature whose

properties can be demonstrated. Such linkages are drawn out from the nature or essence of the triangle, and are not an artifact of an arbitrary act of mental abstraction from experience or of creative composition. Descartes says the idea of God is within him "just as surely as the idea of any shape or number. And that it belongs to God's nature that he always exists as something I understand no less clearly and distinctly than is the case when I demonstrate in regard to some figure or number that something belongs to the nature of that figure or number" (ibid. 65; 45). In this connection it is worth noting that Descartes's version of the ontological argument is just another instance of analyzing innate ideas.

We can now summarize the criteria that Descartes uses for distinguishing innate ideas at the time of the *Meditations*. (He'll change these later.) (1) They have as their content immutable general natures that come from God and are innately present to the mind but are not of the mind's invention. (2) The objective reality of such ideas is a true and real being (*verum et reale ens*) that is independent of volition and sensory experience. (3) The mind is able to analyze and demonstrate necessary connections among the properties of such general natures, for example those inherent in a triangle, insofar as they are the object of the mind's attention.

Descartes adds certain universal principles to innate conceptions of quantity and ideas of immutable natures. For example, in the third postulate of the geometrical appendix to the *Second Reply*, readers are told "to ponder those self-evident propositions that they will find within themselves, such as 'The same thing cannot both be and not be at the same time' " (AT 7:163; CSM 2:115).

As we've seen, innate ideas exist though they are not always being attended to as objects of our awareness. In the *Third Reply* we are told: "when we assert that some idea is innate in us, we do not have in mind that we always notice it (for in that event no idea would ever be innate), but only that we have in ourselves the power to elicit the idea" (AT 7:189; CSM 2:132).

In his reply to Gassendi, the *Fifth Reply*, Descartes discusses how innate ideas are involved in acts of perceiving.

> I do not concede . . . that the ideas of these figures ever come into our minds via the senses. . . . For although the world could undoubtedly contain figures such as those the geometers study, I nevertheless maintain that there are no such figures in our environment except ones so small that they cannot in any way impinge on our senses. Geometrical figures are composed for the most part of straight lines; yet no part of a line that was really straight could ever affect our senses, since when we examine through a magnifying glass those lines which appear most straight we find they are quite irregular and always

> form wavy curves. Hence, when in our childhood we first happened to see a triangular figure drawn on paper, it cannot have been this figure that showed us how we should conceive of the true triangle studied by the geometers, since the true triangle is contained in the figure only in the way in which the statue of Mercury is contained in a rough block of wood. But since the idea of the true triangle was already in us, and could be conceived by our mind more easily than the more composite figure of the triangle drawn on paper, when we saw the composite figure we did not apprehend what we saw, but rather the true triangle . . . thus we could not recognize the geometrical triangle from the diagram on the paper unless our mind already possessed the idea of it from some other source. (AT 7:382; CSM 2:262)

Our ideas of geometrical entities are not established in the mind by any method that abstracts elements from what is given in experience. For example, when we perceive a triangle traced on the paper, we can't claim to perceive straight lines since none are present on the paper. On the contrary: the idea of straight is present innately, and on the occasion of a particular perception the general innate idea is applied to the material object perceived by the senses. In this way the mind conceptualizes the sensory input. Consequently, our innate ideas of geometrical entities, as concepts, provide an internal standard that is the genus of a species by which we judge that a concretely given figure is of a particular sort or type. Thus, the general properties of being a triangle are present innately to the mind. Thus, to even see a triangle inscribed on paper is to recognize it as a triangle, something that conforms to the triangle possessed by the mind. There were hints of this idea of conceptualization by the mind in the account of the perception of the wax in *Meditation* III and that of the size, shape, and distance of objects in the *Optics*. Both arguments show the essential involvement of intellection in acts of perception. This is a significant point to which we return shortly in connection with intellectual memory.

Innateness and Sensory Ideas

There is no doubt, then, that Descartes thinks that the mind has ideas whose content can be drawn out by reflection, and that ideas form in the mind in response to what happens on specific occasions. In *Notes on a Certain Program* (*Notae in Programma quoddam*) (1648), Descartes seems to identify the innateness of ideas with the innateness of specific faculties and dispositions (see McRae 1972b; Pitte 1985, 370). He replies

to Regius's claim that innate ideas, or notions, or axioms, are unnecessary, since we need only recognize that the mind has a natural power to think, by saying that "he [Regius] is plainly saying the same thing as I, though verbally denying it." He continues:

> I have never written or taken the view that the mind requires innate ideas which are something distinct from its own faculty of thinking. I did, however, observe that there were certain thoughts within me which neither came to me from external objects nor were determined by my will, but which came solely from the power of thinking within me; so I applied the term "innate" to the idea or notions which are the forms of these thoughts in order to distinguish them from others, which I called "adventitious" or "made up." (AT 8.2:358; CSM 1:303)

He goes on to say that ideas are innate in the sense in which diseases are innate: "not that the infants of such families suffer from the diseases in their mother's wombs, but because they were born with a certain disposition or faculty to contract them" (ibid. 358; 304).

These observations have some similarities to the texts we have been considering. But Descartes goes on to say something more precise: "we must admit that in no case are the ideas of things presented to us by the senses just as we form them in our thinking. So much so that there is nothing in our ideas which is not innate to the mind or the faculty of thinking, with the sole exception of those circumstances which relate to experience, such as the fact that we judge that this or that idea which we now have immediately before our mind refers to a certain thing situated outside us. We make such a judgment not because these things transmit the ideas to our mind through the sense organs, but because they transmit something which, at exactly that moment, gives the mind occasion to form these ideas by means of a faculty innate to it" (AT 8.2:359; CSM 1:304). Thus, the general form of the content of our sensory ideas is not sent to the mind by the sense organs, but rather the sense organs on a particular occasion incite the mind to form general ideas by means of its innate faculty. In other words, the mind has an innate power to conceptualize ideas in response to particular circumstances in the environment. Accordingly, the mind has the ability to form these general ideas from its own resources. It's important that we see the import of Descartes's claim. When he says that sensory ideas are innate, Descartes is referring to his claim that the mind has an innate power to produce them as conceptualized. But sensory ideas do not depend on the mind alone, since the mental faculty has to be triggered by the appropriate circumstances in the external environment. Without the relevant occurrences taking place at a particular time, sensory ideas that appropriately respond to those circum-

stances could never be formed by the mind (Schmaltz 1997, 36–37). Furthermore, in forming sensory ideas the innate mental faculty acts nonvolitionally, since the sensory content it brings about is constrained with respect to what is taking place in the outer senses. It is in this precise sense that sensory ideas have conceptual content and yet are causally dependent on the presence of motions emanating from external objects.

But how is this relationship to be spelled out? Although God organizes nature such that corporeal motions and the mental formation of sensory ideas are coordinated together, we will argue in the next chapter that this is not the end of the story. In our view Descartes has the conceptual resources necessary to cover the causal gap created by the ordination of nature, as well as for avoiding the occasionalist account of causation.

Roughly, the picture we will seek to establish is this. The mind, when it undergoes a particular episode of perceptual experience, must somehow create mentally what is occurring corporeally in the sense organs. It does this by intentionally bringing the content of the corporeal motions that represent an external object under the appropriate innate and general concepts. In so doing, it becomes aware of the motions the object causes in the pineal gland. But it is not aware of them formally; that is, it does not peer into the brain such that it becomes aware of them qua corpuscular motions occurring in a part of the brain. Rather, it becomes aware of the motions objectively; that is, it becomes aware of their objective or representative content. This relation, as we'll argue in detail, is one of transparent intentionality. The mind "sees" the object by becoming aware of the objective content in the gland, and correspondingly the corporeal object is the exemplar cause of what the mind sees.

The picture of the nature and production of sensory ideas that Descartes presents in the *Notes* is as follows. The corporeal motions that give rise to various sensory ideas are neither resemblances nor replicas of these ideas. Thus, mental ideas can't be identified with such motions, nor do they derive directly from them. Certainly it doesn't follow that sensations are innate simply because they don't resemble corporeal motions. But Descartes's emphasis is on the positive claim that sensory ideas involve the production of conceptual content in virtue of the innate power of the mind.

> we must admit that in no case are the ideas of things presented to us by the senses just as we form them in our thinking. So much so that there is nothing in our ideas which is not innate to the mind or the faculty of thinking, with the sole exception of those circumstances which relate to experience, such as the fact that we judge this or that idea which we now have immediately before our mind refers to a certain thing situated outside of us. We make such a judgment not

> because these things transmit the ideas to our mind through the sense organs, but because they transmit something which, at exactly that moment, gives the mind occasion to form these ideas by means of the faculty innate to it. Nothing reaches our mind from external objects through the sense organs except certain corporeal motions, as our author [Regius] himself asserts in article nineteen, in accordance with my own principles. But neither the motions themselves nor the figures arising from them are conceived by us exactly as they occur in the sense organs, as I have explained at length in my *Optics*. Hence it follows that the very ideas of the motions themselves and of the figures are innate in us. The ideas of pain, colors, sounds and the like must be all the more innate if, on the occasion of certain corporeal motions, our mind is to be capable of representing them to itself, for there is no similarity between these ideas and the corporeal motions. Is it possible to imagine anything more absurd than that all the common notions within the mind arise from such motions and cannot exist without them? (AT 8.2:359; CSM 1:304)

Here Descartes adds further kinds of innate ideas to his list. Before he had cited ideas of reflection, quantity, immutable natures, and common notions. Now he adds ideas of color, sound, and pains. The reason for this addition becomes clear if we recall that earlier in the *Meditations* and the *Principles*, Descartes stresses the active work that the mind performs in conceiving a stimulus arising from external objects. Without the effect that these particular objects have on the mind, the mind wouldn't have the sensations and perceptions it in fact has on specific occasions. But the conceptual form of these experiences, as conscious contents of immediate awareness, is not simply given. The forms need to be created by the mind's active work. This applies to color as much as to ideas of reflection and common notions.

Innate Ideas: Present but Swamped

In 1648 Burman observes that if, as Descartes claims, we have innate ideas of God and of ourselves, would this not mean that infants have "an actual idea of God." Descartes replies that this is improbable since "in infancy the mind is so swamped inside the body that the only thoughts it has are those which result from the way the body is affected" (AT 5:150; CSMK 336). But does this mean that nevertheless the infant possesses innate ideas that in infancy and youth are impeded, obstructed, and distorted by bodily directed thoughts and sensations? Or does it mean that we learn with difficulty to overcome the preconceptions imbued in us by

sensory experience and come to attend to what is self-evidently present in the mind itself? (On this specific perspective see *Principles* I.71, 72, 73, and 74.) The notion that the mind is overpowered and directed away from itself by the presence of the body in infancy and youth also appears in the *Fifth Reply* (1641) and in the *Principles*, Part I, articles 47 and 71 (1644) (AT 8.1:22, 35; CSM 1:208, 218). The "present but swamped" position is most evident, however, in a letter to Hyperaspistes in August 1641, and here Descartes is meticulous in detail:

> I had proved that the nature or essence of the soul consists in the fact that it is thinking, just as the essence of body consists in the fact that it is extended. Now nothing can ever be deprived of its own essence; so it seems to me that a man who denies that his soul was thinking at times when he does not remember noticing it thinking, deserves no more attention than a man who denies that his body was extended when he did not notice that it had extension. This does not mean that I believe that the mind of an infant meditates on metaphysics in its mother's womb; not at all. We know by experience that our minds are so closely joined to our bodies as to be almost always acted upon by them; and though in an adult and healthy body the mind enjoys some liberty to think of other things than those presented to the senses, we know there is not the same liberty in those who are sick or asleep or very young, so . . . it seems most reasonable to think that a mind newly united to an infant's body is wholly occupied in perceiving or feeling the ideas of pain, pleasure, heat, cold and other similar ideas which arise from the union and intermingling with the body. Nonetheless, it has in itself the ideas of God, itself, and all such truths as are called self-evident, in the same way as adult humans have when they are not attending to them; it does not acquire these ideas later on, as it grows older. I have no doubt that if it were released of the prison of the body, it would find them within itself. (AT 3:423–24; CSMK 189–90)

What are we to make of this account that is close to the account in the *Principles* and to his discussion with Burman? Notice that Descartes mentions as innate the ideas of God, the self, and common notions, all of which are revealed to the mind by reflection. As we have seen, despite his language, Descartes is not saying that these ideas are implanted in the mind and are present there fully fledged from birth. Thus, literally speaking, they are not "present but swamped" by the senses. Certainly, the ability to reflect upon them is obscured by bodily sensations and by thoughts directed toward the senses. So when Descartes says that were we freed of our bodily presence we would find such ideas within us, he simply means that our reflective attention toward them would be entirely

unhindered by the senses and sensory-directed thought. We have to learn, however, to transcend sense confusion and direct the mind away from its bodily orientation. In other words, we have to learn to see things clearly and distinctly in the light of these innate ideas and what they contain. This accords with what Descartes tells Mersenne in 1641, namely, that in the case of a genuine innate idea, I can "draw out . . . something which was implicitly contained in it but which I did not at first notice in it" (AT 3:383; CSMK 183).

It is clear that Descartes believes that God is the source of our innate ideas. Certain of these ideas are general or genus-like concepts that function to inform specific ideas on certain occasions, and to provide the conceptual content (as we shall see in the next chapter) of individual or particular sense experiences. But if God is the source of our innate ideas, he is also the cause that makes these ideas persist in us. This should remind us of our discussion in chapter 4 of God's immutability as the genus of motion. Just as God is the cause of continuity of motion, so is he also the cause of the identity of our ideas over time, even though our minds are created anew in each separate moment of time. So there is a connection between God's constant re-creation of the world of matter and his re-creation of the world of mind.

Innateness and Intellectual Memory

Another mode of reasoning involving innate ideas Descartes illustrates in *Meditation* III by the example of the sun. He tells us that the sun appears under two diverse ideas, one derived from the senses, and one arrived at by astronomical reasoning and "elicited from certain notions that are innate in me" (AT 7:39; CSM 2:27). Astronomical science rests on the general innate ideas of geometry and optics, and on the common notions of causal reasoning, which come into use when we construct scientific explanations (i.e., employ forms of reasoning and inferring).

But in what sense does Descartes consider the *general* concepts of natural science to be innate? It is clear that they are acquired and not present in the mind in any sense from birth. But it is also clear that Descartes considers them to function in the mind as innate and general ideas. To answer this question we need to consider his views concerning intellectual and corporeal memory, a topic that assumes an increased importance in his late thought. The distinction is connected with his views on the role memory plays in the learning process, and, as we'll see in the next chapter, it is also connected to his late views on perception. There are eleven principal letters in Descartes's correspondence, stretching from 1630 to 1648, that deal with aspects of this topic: To Mersenne, March 18, 1630, April

1, 1640, and August 6, 1640; to Meysonnier, January 29, 1640; to Hyperaspistes, August 1641; to Newcastle, November 23, 1646; to Chanut, February 1, 1647, June 6, 1647; to Arnauld, June 4, 1648, July 29, 1648; and to Burman, April 16, 1648.

But what does Descartes mean by intellectual memory, and how does he distinguish it from corporeal memory? He makes the distinction in a letter to Mersenne (April 1, 1640): "But besides this memory [corporeal], which depends on the body, I believe there is also another one, entirely intellectual, which depends on the soul (*l'âme*) alone" (AT 3:48; CSMK 146). He later elaborates this account in response to Burman's claim in 1648 that we have intellectual memory in the absence of brain traces (the basis of corporeal memory), for example in our ideas of angels and disembodied souls. Descartes replies:

> I do not refuse to admit intellectual memory; it does exist. When for example, on hearing that the word K-I-N-G signifies supreme power, I commit this to my memory and then subsequently recall the meaning by means of my memory, it must be the intellectual memory that makes this possible. For there is certainly no relationship between the four letters (K-I-N-G) and their meaning, which would enable me to derive the meaning from the letters. It is the intellectual memory that enables me to recall what the letters stand for. However, this intellectual memory has universals rather than particulars as it objects, and so it cannot enable us to recall every single thing we have done. (AT 5:150; CSMK 336)

The first thing to notice is that the task of intellectual memory, for Descartes, is to store general, genus-like concepts, whereas the task of the corporeal memory is to store, as brain traces, particular impressions arising on individual occasions, which when repeated through similar impressions come to represent kinds of sense experience. This is how we and animals can recognize, on further occasions, a threatening species of predator.

But Descartes's chief claim is that there is no nonarbitrary relationship between the letters K-I-N-G and the meaning the word has in the mind. Any significance it has for the hearer doesn't lie, claims Descartes, in the physical sensation of hearing the word, and thus in the activation of traces already imprinted in the brain. It is the mind alone that activates its memory of the general concept of secular supreme power, on the occasion of hearing that particular word. Accordingly, my ability to apprehend the word's meaning, on any particular occasion of hearing it, is due entirely to intellectual memory and its teleological structure. The meaning of the word is the importance it has for our use.

Two letters to Arnauld in 1648 throw further light on the distinction, and connect it explicitly to memory-recognition and learning. On June 4, 1648, he says to Arnauld: "I agree with you there are two different powers of memory; but I am convinced that in the mind of an infant there have never been any pure acts of understanding, but only confused sensations. Although these confused sensations leave some traces in the brain, which remain there for life, that does not suffice to enable us to remember them. For that to take place, we would have to observe that the sensations which come to us as adults are like those which we had in our mother's womb; and that in turn would require a certain reflexion of the intellect or intellectual memory (*quadem reflexione intellectus sive memoriae intellectualis*) which was not possible in the womb" (AT 5:193; CSMK 354). He makes a similar point on July 29, 1648, again to Arnauld: "If we try to remember something, it is not sufficient that the thing should previously have been before our mind and left some traces in the brain which give occasion for it to come into our thoughts again; it is necessary in addition that we should recognize (*ut agnoscamus*), when it comes the second time, that this is happening because it has already been perceived by us earlier (*a nobis fuerit percepta*)" (AT 5:220; CSMK 356). In these passages Descartes is pointing to the indispensable role that intellectual memory plays, in virtue of its being a mental power that operates independently of brain traces. To be more precise, he's speaking of a reflexive act of the mind that, through learning and experience, is able to "recognize" that previous traces impressed on the brain resemble recently impressed patterns. Thus, the confused traces of our earlier life, though present in the brain, are not sufficient to enable us to recognize a common pattern between what we now experience and what we have experienced earlier. We are beyond the sheep that simply sees a wolf as a predator.

To get a fuller sense of Descartes's position consider the key passage that follows the one quoted above: "From this it is clear that it is not sufficient for memory that there should be traces left in the brain by preceding thoughts. The traces have to be of such a kind that the mind recognizes (*ut mens agnoscat*) that they were not always present in us, but were once newly impressed. Now for the mind to recognize this (*mens posit istud agnoscere*), I think that at their first impression it must have made use of pure intellect to notice that the thing which was then presented to it was new and had not been presented before; because there cannot be any corporeal trace of this novelty (*nullum enim corporeum vestigium istius novitatis esse potest*). So then, if ever I wrote that the thoughts of children leave no traces in their brain, I meant traces sufficient for memory, that is, traces which at the time of their impression are observed by pure intellection (*advertimus per intellectionem puram*)." Descartes then analogizes the distinction between direct and reflex thought to direct and

reflex vision and concludes: "I call the first and simple thoughts of infants direct and not reflex (*non reflexas*) . . . but when the adult feels something, and simultaneously perceives that he has not felt it before, I call this second perception *reflexion* (*secundam perceptionem reflexionem*), and attribute (*refero*) it to the intellect alone, in spite of its being so linked to sensation that the two occur together and appear to be indistinguishable from one another" (AT 5:220–21; CSMK 356–57).

This passage goes to the heart of Descartes's position. Interestingly enough, it does not contradict what he tells Hyperaspistes in 1641. As we saw there, the soul has the ideas of God, of the self, and of immutable natures from birth. But in childhood these ideas are swamped by the union of mind with body: innate ideas of this sort are swamped in the mind by the presence of bodily sensations. They fall into one category, but the innate ideas of the sciences fall into another. They are general ideas and concepts established by pure intellect as the result of learning and recognition. But why does Descartes appeal to a reflexive act of the intellect or to intellectual memory? Because the traces impressed on the brain are events that, as such, don't carry any intrinsic validation of the sort or kind that they are. Brain traces merely "move the soul in the same way as it moved before, and thus make it remember something. It is rather as the folds in a piece of paper or cloth make it easier to fold again in that way than it would be if it had never been folded before" (to Mesland, May 2, 1644; AT 4:114; CSMK 233). But it is the intellect alone that is able to establish a sort or kind by recognizing traces initially and then subsequently by bringing them under a general concept or genus. But these general concepts, although acquired in sensory experience through learning and recognition, function as innate concepts in the intellect. That is, "the memory of intellectual things depends on some other traces which remain in the mind itself" (ibid.).

We can now connect Descartes's espousal of innate ideas with his rejection of the method of abstraction and his acceptance of the method of exclusion in the early 1640s. In *Meditation* III, Descartes argues that his idea of God neither derives from the senses nor is of his own making (*nec etiam a me efficta est*), and therefore it must be innate. The idea is not of his own making, claims Descartes, since he is not able to take away anything from it or add anything to it (*nam nihil ab illa detrahere, nihil illi superaddere plane possum*), which he would be able to do were it factitious (AT 7:51; CSM 2:35). This is precisely what Gassendi attacks: "although every supreme perfection is normally attributed to God, it seems that such perfections are all ideas taken from things which we commonly admire in ourselves . . . by amplifying these things as much as we can, we assert that God is eternal, omnipotent, omniscient, supremely good, supremely blessed and so on. Hence the idea representing all these

things does not contain more objective reality than the finite things taken together; the idea in question is compounded and augmented from the ideas of these finite things in the manner just described" (AT 7:287; CSM 2:200). Gassendi goes on to say that the idea of God could have been partly derived from the senses and partly of Descartes's making. "When you say that you cannot add anything to it or take anything away, remember that when you first acquired it was not as perfect as it is now" (ibid. 305; 212). In other words, the idea of God is derived from the perfections we accord to created things and, as a consequence, is always open to augmentation.

Descartes's reply is significant:

> When you attack my statement that nothing can be added to or taken away from the idea of God, it seems that you have paid no attention to the common philosophical maxim that the essences of things are indivisible. An idea represents the essence of a thing, and if anything is added to or taken away from the essence, then the idea automatically becomes the idea of something else. This is how the ideas of Pandora and of all the false Gods are formed by those who do not have a correct conception of the true God. But once the idea of the true God has been conceived, although we may detect additional perfections in him which we had not yet noticed, this does not mean that we have augmented the idea of God, we have simply made it more distinct and explicit, since, so long as we suppose that our original idea was a true one, it must have contained all those perfections. (Ibid. 371; 255–56)

Thus, far from augmenting perfections that have been gained from experience of finite things, we are able to detect, draw out, and make distinct, perfections already contained in the idea of God that we innately possess. In short, "the idea of God is not gradually formed by us when we amplify the perfections of his creatures; it is formed all at once and in its entirety as soon as our mind reaches an infinite being which is incapable of any amplification" (ibid.). Notice that this is the criterion for innate ideas that Descartes proposes to Mersenne in 1641 (see above), namely, that the content of an innate, as opposed to that of a constructed, idea is such that when we draw out what's implicit in it, we don't rediscover what we ourselves have placed there.

But in replying to Gassendi, Descartes puts forward a related criterion for innateness: if an idea is innate, we grasp the essence it represents all at once and in its entirety. For Descartes this means that when the mind grasps an essence, the content it represents *refers* to the essence as a whole and not to a part of it: if it is otherwise, the mind grasps an idea of something other than that essence. With respect to God, it is only if the idea

we possess of God represents the essence of God, that are we able to think or refer to God (see Lennon 1995, 163). In short, essence determines reference. So Descartes's claim that essences are indivisible means that an idea either represents the whole of what it is or else fails to represent at all. In short, either we grasp entirely a concept's nature or we do not. If we do we grasp the essence to which an idea refers, we grasp positively and immediately both what it *includes* and what it *excludes*. Thus, for Descartes, unlike Gassendi, general and innate concepts are not constructed by the mind by abstracting from particulars. *Principles* I.63 puts the difference between abstraction and exclusion succinctly: "And a concept does not become more distinct because we include fewer things in it, but only because we carefully distinguish those things which we do include in it from all others" (AT 8.1:31; CSM 1:215). Thus, for Descartes, an idea that satisfies the criteria of exclusion and innateness cannot be made "inadequate by the abstraction of my intellect" (letter to Gibieuf, January 19, 1642; AT 3:474; CSMK 201).

Common Notions, Eternal Truths, and Immutable Natures

The Latin *Principles* (1644) signals an important shift in Descartes's thinking about eternal truths. To get a handle on this let's remind ourselves of what he says about eternal truth from 1630 to 1641. In the letters to Mersenne of 1630 Descartes speaks of the "mathematical truths which you [Mersenne] call eternal which have been laid down by God and depend on him no less than the rest of His creatures" (April 15, 1630; AT 1:145; CSMK 23). He goes on to say that these truths are caused by God who is "the Author of the essence of created things no less than of their existence; and this essence is nothing other than the eternal truths" (May 27, 1630; 152; 25). Here Descartes equates eternal truths with essences that he conceives to be products of God's creative power. Yet God is free "to make it true that not all the radii of the circle are equal—just as free as he was not to create the world. And it is certain that these truths are no more necessarily attached to his essence than are other created things" (ibid. 152; 25). In the *Fifth Meditation* Descartes says he finds "within himself" ideas of things that "even though they may not exist anywhere outside me still cannot be called nothing." He says that these things are not his invention, and have "their own true and immutable natures." Later, elaborating, he speaks of their "determinate nature, essence, or form which is immutable and eternal" (AT 7:64; CSM 2:45). As an example, he cites the triangle whose properties he claims are imposed upon the mind, properties that can be objectively demonstrated and hence are not his arbitrary invention.

This position is elaborated in the *Sixth Reply*, where he says again that everything depends on God. As we noted in chapter 2, Descartes concludes by saying that "there cannot be any kind of entity that does not depend on God. . . . Hence we should not suppose the eternal truths depend on the human intellect or on other existing things; they depend on God alone, who as supreme legislator has ordained them from all eternity" (AT 7:436; CSM 2:294).

Descartes's perspective shifts markedly in the *Principles* I, article 49, where he says that "the proposition *Nothing comes from nothing* is regarded not as a really existing thing, or even as a mode of a thing, but as an eternal truth which *resides within our mind*. Such truths are termed common notions or axioms." Gone is reference to divine support, and as well reference to "true and immutable natures" conceived as existing independently of the mind. Descartes merely lists "examples of this class: *It is impossible for the same thing to be and not to be at the same time*; *What is done cannot be undone*; *He who thinks cannot but exist while he thinks*: and countless others." He goes on to tell us that "we cannot fail to know them when the occasion for thinking about them arises, provided that we are not blinded by preconceived notions" (AT 8.1:24; CSM 1:209). Notice that Descartes is now equating eternal truths with common notions and not with essences. But notice too that he is referring to a type of eternal truth, namely, universal "rules of thought" that can be used for various epistemological purposes.

What are we to make of this shift? On the face of it, it seems Descartes has reconceptualized the criteria that define what is to count as an eternal truth. He now claims that eternal truths and what they represent have merely conceptual being in the mind, and no longer have a mode of being independent of *our* modes of conceptualizing them. Their creation would seem to consist *entirely* of minds that possess ideas of them. This is the view Gassendi puts to Descartes in his criticism of the *Fifth Meditation*: "The triangle is a kind of mental rule which you use to find out whether something deserves to be called a triangle. But we should not therefore say that such a triangle is something real, or that it is a true nature distinct from the intellect. For it is the intellect alone which, after seeing material triangles, has formed this nature and made it a common nature" (AT 7:32; CSM 2:223). Interestingly enough, Descartes does not respond directly to Gassendi's criticism. Instead, he takes up Gassendi's observation that it is "hard to propose that there is any 'immutable and eternal nature' apart from almighty God" (AT 7:319; CSM 2:221). He says that Gassendi would be right to claim this "if I was talking about existing things, or if I was proposing something as immutable in the sense that its immutability was independent of God . . . so I do not think that the essences of things, and the mathematical truths which we can know concerning them, are

independent of God. Nevertheless I do think that they are immutable and eternal, since the will and decree of God willed and decreed that they should be so" (ibid. 380; 261).

Descartes's silence in the face of Gassendi's conceptualist criticism is telling. This is the last time (1641–42) he uses the "Platonically" inspired language of "true and immutable natures" in reference to eternal truths. It may be that at this point he was troubled about his position, but had yet to work out an alternative line on the nature and status of eternal truths. Accordingly, he contented himself with reminding Gassendi that, given the immutability of eternal truths, this in no way makes them independent of God's immutability.

We can begin looking at this shift by noting what Descartes says in *Principles* I, article 49. He contrasts eternal truths / common notions that have no existence outside our minds with created things that exist, such as substances and their modes. Thus, whatever their ontic status, eternal truths are not items in *rerum natura*. The import of what Descartes has in mind becomes evident if we look at articles 55 and 59. In *Principles*, Part I, article 55, he tells that "we should not regard order or number as anything separate from the things which are ordered or numbered, but should think of them simply as modes under which we consider the thing in question" (AT 8.1:26; CSM 1:211) Descartes's meaning is made clear in article 59, in which he extends his explicit nominalism to how universals and mathematical notions are established in the created world: "When we see two stones, for example, and direct our attention not to their nature but merely to the fact that there are two of them, we form the idea of the number which we call 'two' . . . This, then, is the universal idea; and we always designate the number in question by the same universal term 'two.' In the same way, when we see a figure made up of three lines, we form an idea of it which we call the idea of triangle; and we later make use of it as a universal idea, so as to represent to our mind all the other figures made up of three lines" (ibid. 27–28; 212). Notice that Descartes emphasizes the work of the mind, and how it is that, in respect of existing things, we come to construct and use universal ideas. When we consider universal ideas abstractly we see there is only a distinction of reason in our mind between, for example, the number three and the things numbered. that is, there is no separate entity named *three* which exits in the world alongside things numbered. Similarly, Descartes's emphasis is not on "true and immutable natures' inherent in the triangle that impose themselves on the mind; it is on how *we* construct the universal idea of "triangularity" that applies to all individual triangles. We use a particular triangle as an example in a certain way and for a certain purpose, that is, to apply to any triangle of a certain sort. Descartes's position is now akin, ironically enough, to the conceptualism Gassendi proposed

in his *Sixth Objection*. However, he has not fallen back on abstractionism: he is saying that we *use* general terms as an expedient way to refer to all things of the same type. Thus, common notions are not ideas of essences; rather, like general principles, they are "rules of thought" used by us to perform various epistemic tasks. Descartes calls them "eternal truths" because they are self-evidently present to the mind and underwrite our ability to think about our experience. Thus, within us "besides the notions of God and of our mind, we have knowledge of many propositions which are eternally true, such as 'Nothing comes from nothing' " (AT 8.1:38; CSM 1:221).

Does this mean that Descartes has given up the view that eternal truths are essences that exist in divine nature? Not at all. It means that he is distinguishing how we understand essences when we consider them apart from existing things and how we grasp them through existing things. He makes this clear in a letter to an unknown correspondent in 1645 or 1646: "we understand the essence of a thing in one way when we abstract it from the fact whether it exists or not, and in another way when we consider it as existing" (AT 4:349; CSMK 280). Thus, talk of essences existing in divine nature, as in the 1630 letters to Mersenne, raises *ontological* questions about their origin and their mode of being in the divine mind. The discussion in the *Principles* is epistemic; it is concerned with how we learn and establish eternal truths through our reflective experience of encountering things in *rerum natura*. The answer to this question does not preclude asking ontological questions about their divine origin and their mode of existence in God. In other words, if Descartes thinks there is only a distinction of reason in our mind between universals and things, this does not address the separate question of their origin and mode of being in God's mind.

What leads Descartes to focus exclusively on epistemic questions about eternal truths in the *Principles*? In our view, he had become increasingly struck with the limitations of the human intellect in the face of the vast infinitude of God's power. We have seen this attitude developing in his writings from the very beginning. Now in the post-*Meditation* period he began to think through more insistently the boundaries of human cognition in the light of the ongoing dialogue between himself and the infinitude of divine nature. In the early letters to Mersenne, Descartes allows that "eternal truths" are indubitable for us, because God decrees it should be so and has endowed us with cognitive access to them. Thus, they are not true in and of themselves, and it is presumptuous to assume that they have the power, in their own right, of determining God's will. This, of course, raises an important question: If God's will cannot be constrained, even by eternal truths, a divide yawns between what God can do and what we are able to conceive as possible or impossible for God to do.

How can we know that what is inconceivable for us, is also inconsistent with God's perfection? In other words, what is conceivable or inconceivable for us is not the measure of what God's omnipotence may or may not do. (For a discussion of the modalities involved see Ishiguro 1986.) Reasoning in this vein, Descartes came to see more clearly that just as God's transcendent nature is beyond our comprehension, so likewise, there is much in created reality that surpasses our cognitive grasp since it lies beyond the limitations of the finite intellect. Thus, his silence in the *Principles* about the creation of eternal truths probably reflects his renewed belief in the inscrutability of God's nature and what we can intelligibly say about it. We return to these issues in reference to the mind-body distinction in the next chapter.

But if the late Descartes attributes so much to the role of innate ideas, what function is left for sense experience? Indeed, how does perception and sensation work? As we shall see, answering this question gets us to the heart of Descartes's mature position concerning the mind-body union.

Chapter Six

MIND-BODY CAUSALITY AND THE MIND-BODY UNION

The Case of Sensation

The thorniest problem in all Cartesian literature is his view of the mind-body union. For understanding this vexed issue, Descartes's analysis of sensation provides a central and telling example. The main problems are these: (*a*) how does the physical relate to the mental, and vice versa, in a particular act of sensing? And (*b*) how does Descartes's understanding of sensation accord with his causal principles and with his late theory of body-body causation? In the later parts of this chapter we shall discuss mind-to-body causation with an eye to where this leaves Descartes in regard to the mind-body union. We shall end this book with a discussion of the extent to which Descartes may be said to be a dualist. To presage the end, we shall argue that Descartes's mature position can be called epistemic dualism, which, given his doctrine of the harmonious re-creation of the world and his epistemic teleology, fails even to entail a strong form of property dualism (*pace* Clarke 2003).

Descartes originally set up his theory of visual perception in considerable detail in his *Optics* (*Dioptrique*, 1637), and he continues to refer to this work throughout his life (Cf. *Passions* I, art. 12). The *Optics* was virtually completed before Descartes started working on his *World* (around 1629), but it was not published until 1637, where it was one of the three essays appended to the *Discourse on Method*. That this work should remain a touchstone for almost twenty years would seem to signify that, at least on the topic of how vision works, Descartes did not change his mind. And to some extent this is true. The *Optics*, as we shall see, along with his *Treatise on Man* (*Traité de l'Homme*)—which was to be Part II of the *World*—contains the basic theory of the mechanical, causal operation of sight and the senses. Though minor refinements come into Descartes's later writing, this mechanical theory remains constant over time. It constitutes Descartes's attempt to provide an account of perception alternative to that offered by the Scholastics, who theorized in terms of intentional species (*species* or *formae*). Indeed, as Tad Schmaltz (1997) and Desmond Clarke (2003, chap. 1) argue, Descartes's theory gains its

novelty and its force from being an alternative to Scholastic theory. But in developing his account, Descartes is forced to provide an alternative explanation of how knowledge is related to sensation, and this account does change radically as he revises his views on the role and function of the mind. The lack of any detailed discussion about the role of the mind in these early works on vision allows Descartes to keep the physico-mechanical theory much the same. Given that this is so, we shall take up his account of sensation in 1641 in the *Meditations*, referring back to the earlier works for details when necessary.

Sensation

Descartes sets up the problem of sensation in *Meditation* VI in the context of proving the existence of corporeal objects. Recall that he is trying to show that sensible ideas of corporeal objects cannot be caused by oneself or by God, and so, God not being a deceiver, they must be caused by corporeal objects themselves. Only in this way can we be assured of a material world about which humans may gain partial knowledge. As we have noted, the causal language used in this argument is tied to his realism about the active properties of material objects and motion, yet the causal language persists even when he changes his mind about these topics, and it is this persistence of causal language that ought to be accounted for (see Wilson 1999b).

Specifically, at the time of *Meditation* VI, Descartes still claims that there must be something active (*quaedam activa etaim existeret*) capable of producing or bringing about (*producendi vel efficiendi*) these ideas of sensible bodies in one's passive faculty of sensation. He argues that this active power must be in another substance distinct from oneself—a substance that contains either formally or eminently all the reality that exists objectively in the ideas produced by this power. This substance is a body, that is, a corporeal nature, which contains formally or eminently everything that is to be found objectively, or by representation, in the idea (AT 7:79; CSM 2:55). Both Margaret Wilson (1999a) and Alison Simmons (2003) have effectively argued that this containment principle does not commit Descartes to any form of primary-secondary quality distinction for sensations. We believe this is true, but it is not our concern here.

Descartes writes:

> For God has given me no faculty at all for recognizing any such source for these ideas; on the contrary, he has given me a great propensity to believe they are produced (*emitti*) by corporeal things. So 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. It follows that corporeal things exist. (AT 7:80; CSM 55)

Here he notes that we have a propensity to believe or to make a judgment that corporeal objects *produce* our ideas (of them), and, moreover, that we have no faculty in us that would allow us to develop a theory that would attribute the cause of these ideas to anything else. This is clear indication that Descartes's epistemic concerns are beginning to become explicit regarding what humans may know. By means of our science we should be able to figure out the causes of the sensory knowledge we have. What we do is to theorize that the sensations are *produced by* corporeal things. Later he again uses "immediately affects" and "occasions" to make his point:

> My final observation is that any given movement occurring in the part of the brain that immediately affects (*immediate mentem afficit*) the mind brings on (or occasions) (*inferat*) just one corresponding sensation; and hence the best system that could be devised (*nihil hac in re melius posse excogitari*) is that it should produce one sensation which, of all possible sensations, is most especially and most frequently conducive to the conservation of a healthy man (*hominis sani conservationem*). (AT 7:87; CSM 2:60)

In chapter 2 we commented on this passage regarding its teleological thrust, which will concern us again toward the end of this chapter. But now, the question at hand is this: how can a corporeal body produce a mental sensation?

The causal principle that ought to apply to mind-body interaction is set, as we saw, by Descartes in *Meditation* III, when he says,

> Now it is manifest by the natural light that there must be at least as much reality in the efficient and total cause as in the effect of that cause . . . that which is more perfect (*magis perfectum*)—that is, contains more reality (*plus realitatis*)—cannot arise from what is less perfect. (AT 7:41–42; CSM 2:28)

Since the mind is more perfect than the body, how can any body (our body or an external material body) cause an effect in the mind? It does not seem, as Margaret Wilson (1999a) argues cogently, that the material object can in any sense contain more reality or be more perfect than the mental object, the sensation.

It is important to note that after Descartes takes up the epistemic stance, his perfection axiom takes on a subtle shift. It is no longer only in ontological terms that he considers the mind to be more perfect than the body, though he is still given to talking about created things in ontological

terms. More importantly, we must *conceive* the mind to be more perfect than the body if we are to understand how they are able to interact. That is, as we shall discuss at the end of this chapter, mind-body interaction is a way of understanding human nature. Yet Descartes is still able to talk in ontological terms in 1645, when he writes to Elizabeth:

> The second thing we must know is the nature of our soul. We must know that it subsists apart from the body, and is much nobler than the body. (AT 4:292; CSMK 265)

It seems clear that "nobler" refers to the soul's greater perfection and reality. Descartes's continued use of causal terms, like "occasion," "excite," and "cause" to describe how corporeal objects affect the mind, even after he has given up the idea that material objects have active powers, may tempt us to think that he must mean these verbs in some attenuated sense, or that he has given up his causal perfection axiom. But here it is well to remember that Descartes's axiom refers to the "total cause," and nowhere does he claim that the material object is the total cause of a sensation. We discussed above how he explains body-body causation in terms of *sine quibus non* causal *relata* regulated by the epistemic teleology of conservation. He will use a similar ploy for explaining mind-body and body-mind causal relations.

Descartes, in the *Sixth Reply*, lays out a version of his theory of perception in schematic form by distinguishing three grades of sensation:

> To get a clear view of what sort of certainty attached to the senses, we must distinguish three grades of sensory response. The first is limited to the immediate stimulation (*immediate afficitur*) of the bodily organs by external objects; this can consist in nothing but the motion of particles of the organs, and any change of shape and position resulting from this motion. The second grade comprises all the immediate effects (*immediate resultat*) produced in the mind as a result of being united with a bodily organ which is affected in this way. Such effects include the perceptions of pain, pleasure, thirst, hunger, colors, sound, taste, smell, heat, cold and the like, which arise from the union and as it were the intermingling of mind and body, as explained in the Sixth Meditation. The third grade includes all the judgments about things outside us which we have been accustomed to make from our earliest years—judgments occasioned by the movements of these bodily organs.
>
> For example, when I see a stick, it should not be supposed that certain *intentional forms* (*intentionales species*) fly off the stick towards the eye, but simply that rays of light are reflected off the stick and set up certain movements in the optic nerve, in the brain, as I

> have explained at length in the *Optics*. The movement in the brain, which is common to us and the brutes, is the first grade of sensory response. This leads to the second grade, which extends to the mere perception of the color and light reflected from the stick; it arises from the fact that the mind is intimately conjoined with the brain that it is affected by the movements which occur in it. Nothing more should be referred to the sensory faculty if we wish to distinguish it carefully from the intellect. But suppose that, as a result of being affected by this sensation of color, I judge that the stick, located outside of me, is colored; and suppose on the basis of the extension of the color and its boundaries together with its position in relation to parts of the brain, I make a rational calculation about the size, shape and distance of the stick: although such reasoning is commonly assigned to the senses (which is why I have here referred to it as the third grade of sensory response), it is clear that it depends solely on the intellect. I demonstrated in the *Optics* how size, distance and shape can be perceived by reasoning alone, which works out any one feature from the other features. (AT 7:437; CSM 2:294–95)

At this time in 1641, the three grades or levels of sensation are (1) the purely physical, (2) the immediate mental idea occasioned by the physical sensation, and (3) a judgment of the will about the relation between the mental idea and the material object. (Simmons 2003 gives a good lengthy analysis of this passage, and especially raises problems for any analysis of type 2 sensations.) At this point he gives no more detail, and the only act of the mind explicated is the use of the will to make judgments based upon second-grade mental sensations. This will change.

The Physical Side of Perception

A good way to begin analyzing the human perceptual act is to consider the physical mechanisms at work in the activity of sensing, while carefully keeping clear the functions of the two putatively independent substances: the physical body and the mental intellect. If we were dealing only with nonhuman animals, then perhaps we could stop our analysis with the physical. Yet Descartes holds that even animals see, in some sense (e.g., cats can see in the dark, he says).

> my view is that animals do not see as we do when we are aware that we see, but only as we do when our mind is elsewhere. In such a case the images of external objects are depicted on our retinas, and perhaps the impressions they leave in the optic nerves cause our limbs

> to make various movements, although we are quite unaware of them. In such a case too we move just like automata. (Letter to Fromondus, October 3, 1637; AT 1:423–24; K 36)

The use of "aware" in this passage probably means consciousness of sensation, rather than reflective consciousness. But what should we make of "our mind is elsewhere"? Maybe as we'll argue later it means our mind is not attending to our body. But the latter part of the quotation seems to deal with the purely physical connection, from a perceived material body to a retina, and presumably from there on to the animal brain via the optic nerve. Impressions are then left in the optic nerves that cause our limbs to make certain movements, presumably certain specific kinds of movements. But if this causal story is correct, then "the images of external objects" must carry some content that an animal may use to guide its movements and that is the basis for what it will learn from experience, recorded in physical memory in the folds in the brain. For example, Descartes discusses in a purely mechanical way how a sheep flees from the wolf (Reply to Arnauld, *Fourth Reply*; CSM 3:161, and in *Passions*, AT 11:356; CSM 1:342). But in the case of animals, perceiving stops here; there is no mental action, no mind.

The physical side of things, prima facie, is somewhat clear. However, as we discussed in chapter 3, in Descartes's writings after the *Principles* (after 1644) even physical causal connections have a deeper level that raises problems. In outline, the physical part of perception goes like this: a material body in the world, presumably by the motions of its particles, causes a perceiving animal or human body to have specific correlative motions. The specific cause is the wavelike promulgation of the motions through a medium to the sense organs, which then move in correlative ways, sending motions of the animal spirits through the nerves to the brain (and sometimes to the limbs), and, finally, to the pineal gland. (The clearest early accounts are in *Optics* and *Treatise on Man*, and are similar to what we find later in *Principles* IV and the *Passions*.)

In his *Optics* Descartes had developed this causal theory in considerable geometrical detail, using the word "cause" explicitly. So, for example, in regard to seeing color at a certain position, he writes:

> Thus [his] mind is caused to perceive as many different qualities in these bodies, as there are varieties in the movements that they cause in his brain. (Part IV; AT 6:114; O 90)

Or again, regarding color:

> if the light (i.e., the movement or action with which the sun or some other of the bodies which are said to be luminous pushes a certain

> very subtle material which is found in all transparent bodies) is reflected toward R by the object V, which I assume to be, for example, red (i.e., disposed to make the small particles of this subtle material, which are impelled only in straight lines by the luminous bodies, also move around their centers after having met them; and is disposed, too, that their two movements have between them the proportion required to cause the sensation of the color red), it is certain that the action of these two movements, having at point R encountered a white body (i.e., a body disposed to reflect light in all other directions without changing it), must be reflected from there towards our eyes through the pores of this body . . . and so cause you to see the color red at point R. (*Optics* V; AT 6:118; O 94)

Or again in the *Optics*:

> Now although this picture [the images that form on the back of the eye], in being so transmitted into our head, always retains some resemblance to the objects from which it proceeds, nevertheless, as I have already shown, we must not hold that it is by means of this resemblance that the picture causes us to perceive objects, as if there were yet other eyes in our brain with which we could apprehend it; but rather, that it is the movements of which the picture is composed which, acting immediately on our mind inasmuch as it is united to our body, are so established by nature as to make it have perceptions. (VI; AT 6:130; O 101)

He continues:

> All the qualities that we apprehend in the objects of sight can be reduced to six principle ones, which are: light, color, location, distance, size and shape. And first of all, regarding light and color, which alone properly belong to the sense of sight, it is necessary to think that the nature of our mind is such that the force of the movements in the areas of the brain where the small fibers of the optic nerve originate cause it to perceive light; and the character of these movements cause it to have perception of color: just as the movements of the nerves which respond to the ears cause it to hear sounds, and those of the tongue cause it to taste flavors, and, generally, those nerves of the entire body cause it to feel some tickling when they are moderate, and when they are too violent, some pain; yet in all this, there need be no resemblance between the ideas that the mind conceives and the movements which cause these ideas. (6:130–31; 101)

He gets more specific about the manner of these mechanical connections in a way that it is important to understand in his *Treatise on Man*. Descartes writes:

> just as a figure corresponding to that of the object ABC is traced on the internal surface of the brain according to the different ways in which the tubes 2, 4, 6 are opened, likewise that figure is traced on the surface of the gland according to the ways in which the spirits leave from points a, b, c.
>
> And note by figures here I mean not only things which somehow represent (*representent*) the position of edges and surfaces of objects, but also anything which . . . can give the soul the occasion to perceive (*donner occasion à l'âme de sentir*) movement, size, distance, colors, sounds, smells and other such qualities. And I also include there anything that can make the soul feel pleasure, pain, hunger, thirst, joy, sadness, and other such passions. (AT 11:176–77; CSM 1:106)

For the moment we will ignore the part concerning what this process gives to the soul and the representation relation obtaining between object and the soul, and just concentrate on the correspondences he traces on the physical side of sensation. In *The Passions of the Soul* (1649), he analogizes these connections to ropes or cords, suggesting that while they are present, there is a "substantial" connection in place among them. This rigid connection is almost bodylike. For example in the *Optics*, Descartes had analogized how vision works to the way a blind man "sees" with his cane:

> just as when the blind man . . . touches some object with his cane, it is certain that these objects do not transmit anything to him except that by making his cane move in different ways according to the different inherent qualities, they likewise and in the same ways move the nerves in his hand and then the places in his brain. (IV; AT 114; O 90; see also VI on locating objects with sticks)

Now part of this passage is obviously directed, as noted above, against the Scholastics and their intentional species that are transmitted though a medium. But it is the rigid connection that is like a stick to which we wish to draw attention.

That this is a rigid connection is further supported by a passage in the *Conversation with Burman* concerning article 63 of *Principles* IV (AT 8.1:115), where Descartes had written, "And it must be noted besides that the force of light does not consist in the duration of some movement, but merely in pressure, or in the first effort towards movement, even though the movement itself does not ensue" (AT 5:172; Cottingham 1976, 40).

Descartes elaborates and defends this claim: "Pressure can happen without movement. For example we can take a metal instrument, or a piece of wood or metal, and press it with our hands on either side in

such a way that no motion is produced, since of course the pressure and resistance on both sides are equal. The same thing happens in this case. Material of the second element is pressed against our eye, but since there is some resistance in the eye it exerts pressure in turn on the material. Thus there is pressure on each side, yet without any movement" (AT 5:172; Cottingham 1976, 40). The pressure theory of light is a continuum theory (see Shapiro 1973, 134–266) that requires a rigid body to be constructed between object seen and the perceiver.

In the *Passions*, Descartes analogizes this rigid causal connection by using the concept of a cord or string that attaches the object to the brain (I, art. 12; AT 11:337; CSM 1:133). As Abel Franco has pointed out,

> A possible way of viewing this relationship as a mechanical one and at the same time avoiding having to attribute "power to act" to the external objects—which are only passive matter—could be this. The relationship between our mind and the external object . . . is a relationship in which both extremes (mind and object) are holding the same cord—at the very moment when not only the senses but also the mind turns towards the object (in vision, we look at the object and pay attention to it). At this moment the cord can be pulled by the motion of matter. . . . The mind is an actor in the sense that its intention attaches the rope to the object, and only after the mind has been so hooked up, would the mind be able to react to the motion of objects. So external objects can be said to determine motion but not create it. (2006, 122)

The most important property of these correlative motions is their specificity, which is guaranteed by the rigid connection. This specificity, which is sometimes expressed in terms of preserved images, lies in the relation of representation between the brain motions and an external object. Descartes is assuming that somehow an identity is preserved through the various transformations of the motions from object to brain. This identity is what guarantees that the physical motions in the pineal glad represent the object. In other words, the identity allows us to say that the motions of the pineal gland relate to a specific object that causes them. Therefore we can identify the kind of object that is being physically represented in the objective reality or content of the physical motions in the pineal gland.

In Descartes's later work, after he gives up motion as an active property of material bodies, the motion of bodies as a transfer of a quantity of motion from one body to another becomes problematic, as we have shown in chapter 4. But the late Descartes can still say, at the level of secondary or horizontal causes and speaking in the vernacular, that the body in the world causes, by motion or pressure, the representation of that body in the pineal gland of the perceiving human body. This representation (formally, motions of bodily parts) exists only as long as the object

being perceived stimulates and is in contact with the human body; only as long as the specific causal connection is present. Representation is based on the one-to-one correspondence preserved among the motions that allows the animal (including humans) to use the representation as specific information about some properties of object. So it is in this way, as noted above, that the animal may use the representation to cause behavior that is appropriate to the object.

This act of perceiving is a straightforward (secondary) causal relation between a specific particular object in the world and a specific particular perceiving body. The mechanism is a "bodylike" or rigid connection brought about by an identity of motions from the object through the medium to the bodily senses and, then, to the brain. The motions, we might anachronistically say, carry information, via this one-to-one correspondence, that pertains only to some properties of the objects. This "bodylike" rigid model is continuous with the way Descartes had described perception earlier in the *Optics*, that is, as being the same as the blind man perceiving with his stick (AT 6:114; O 90).

There is a clear way to experience what Descartes is driving at, and to see why the blind man with the stick example is so telling for him. Take a pencil or stick in your hand and shut your eyes. Now touch an object and try to ascertain its shape by moving the rigid stick in your hand over and around the object. You are able to form some sort of "image" of the shape of the object by means of such motions. We believe that this tactile process of image formation is what Descartes has in mind by theorizing such a rigid connection of the bodily motions occurring in perception.

Descartes does not elaborate at length what properties of objects are represented in their motion, but he does say that not all properties are effective and that the perceptually effective properties "are comprised within the subject matter of pure mathematics" (*Meditations* VI; AT 7:80; CSM 2:55). Earlier, in his *Optics*, he had said: "All the qualities that we apprehend in the objects of sight can be reduced to six principle ones, which are: light, color, location, distance, size, and shape" (Part VI; AT 6:136; O 101). So here Descartes makes a change because "light and color, which alone properly belong to the sense of sight," are not clearly mathematical, though he will attempt to provide mechanical explanations of how they function. Later, in *Principles* IV, article 198, he says, "By means of our senses we apprehend nothing in external objects beyond their shapes, sizes and motions" (AT 8.1:321; CSM 1:284). We may infer that the motions representing properties transferred are those that causally specify distinguishable and useful (behaviorally and, in humans, epistemically) properties of corporeal objects. In the later Descartes, size and shape are the only clear examples of such properties, since they are modes of the attribute of extension and are the only properties that may be used to formulate the causal rules of motion (*Principles* II.44–53; AT 8.1:66–

70; M 64–69). Recall, again, that Descartes, by the time of *Principles*, has given up motion (as action) as a property of material bodies. This later view creates a problem for Descartes's account of perception, since these rules, and also the optical principles, require speed and direction for their formulation. In addition, it would seem on Descartes's view that these must be properties that are perceived only over time, since time is a crucial part of their definition. Presumably Descartes does not consider this to be a problem that needs addressing, and perhaps this is because of the rigid manner in which sensation connects to the world, a connection that does not really involve motion but rather an instantaneous transfer from object to brain. However, he proceeds unproblematically, seemingly failing to realize his confusion, to write about perceiving motion and direction. It would be of interest to explore how, if at all, Descartes might handle the direct perception of such time-dependent properties, especially since he has a large general problem in formulating criteria for identity of bodies, motions, and human individuals over time. Fortunately for our purposes in this section, we may follow Descartes's lead and ignore the problem, for it will add nothing to our exposition of mind-body relations.

There is another problem we must mention, but Descartes does not seem to see it and never discusses it. We said above that there is a direct physical correspondence or causal specificity between object properties and brain properties. But this is ambiguous. Is the relation between particular properties of objects and brains at a time, or between kinds of properties? The sheep learns to flee from wolves, not just this wolf. When Descartes speaks about seeing the circle as an ellipse, or seeing the sun as the size of a small coin, he clearly seems to mean the particular properties that an object is exhibiting to us on this occasion. Yet sometimes, he says, we see the coin as round and not elliptical, and yet this is not an intellectual judgment (in the third sense of perception, from the *Sixth Reply*). Yet the human case, which we shall take up below, seems somehow to involve mind and intellect, as Alison Simmons points out (2003, 567). But what about the sheep, which has no mind? We think Descartes here would have to rely on his theory of material memory, and how animals would sense kinds by virtue of their sensation-memory connection, which we discussed in the last chapter.

Yet the problem is more complex. Recall that causal relations, even at the level of horizontal, efficient (moving) causes, are defined only between kinds of things. Individual, particular concrete objects stand in causal relations insofar as they instantiate (or exemplify) kinds that may be causally related. Another way of looking at this is that individual physical objects are causally related vis-à-vis their attributes, not by way of their concrete existence as individuals or particular things. Existents *per se* can cause nothing. Existing is not a way of acting. This accords with Descar-

tes's claim that an efficient cause is the cause only of an individual entity's coming into existence and not of what makes the thing the kind of thing it is, that is, its (general) formal cause.

The existent must do something in order to cause something, and what it does depends upon its nature, attributes, and modes, which are the *kinds* of things it does. Notice that this parallels the discussion we had about substance and substance's attributes in the last chapter. It is only because a thing exists as such and such a kind (having such and such a nature) that it may have causal effects on other kinds of things. Since there is a relation of identity that also characterizes all causal processes (i.e., the effect must be contained in the cause), we must look for the identity in the case of sensation among the motions as they represent the general properties of the object. The particularity of the perceiving event is given only by the fact that it is this perception *now*, at this time, that is occurrent. We return to this point below.

To recapitulate: from the physical point of view, there is a "continuous" causal connection through the "activity" of the motions from the external object to the pineal gland that preserves some property identity throughout the different changes. It is because of this connection that we may say that the motions of the pineal gland represent the object. This resultant representational motion in the pineal gland is the *physical sensation*. Now, it should be noted here that Descartes's causal language in describing these physical relations is active. That is, he is using the ordinary language of action to talk about these motions (*Principles* II.24; AT 8.1:53; CSM 1:233). As we saw in discussing physical causation, he licenses the use of such ordinary action language in *Principles* II.30, where he describes one body moving on the earth rather than the earth moving beneath a body in order "to avoid too great a departure from the ordinary way of speaking" (*Principles* II.30, AT 8.1:56–57; CSM 1:236). This "way of talking" ploy means we can use causal and seemingly referring words, but in so doing we need not commit ourselves to any position about the metaphysics of motion. It may be that such ways of talking, without metaphysical commitment, are all we can do since humans are epistemically limited and are only allowed to "grasp" certain aspects of the way the world is. We have discussed this point before, and shall have more to say about it later.

The Mental Side of Perception

From the mind's side, things are necessarily more complex. Descartes often uses passive causal locutions to discuss the way in which the body brings ideas to the soul. So for example, in the *Optics*, he writes:

> And first of all, regarding light and color, which alone properly belong to the sense of sight, it is necessary to think that the nature of our mind is such that the force of the movements in the areas of the brain where the small fibers of the optic nerve originate cause it to perceive light; and the character of these movements cause it to have perception of color: just as the movements of the nerves which respond to the ears cause it to hear sounds, and those of the tongue cause it to taste flavors, and, generally, those nerves of the entire body cause it to feel some tickling when they are moderate, and when they are too violent, some pain; yet in all this, there need be no resemblance between the ideas that the mind conceives and the movements which cause these ideas. (*Optics* VI; AT 6:130–31; O 101)

However, such passive ways of describing the act of perception are not the only mode of description. Descartes often describes, as in the *Treatise on Man*, how the mind is active in forming its ideas from those images on the gland. So he writes:

> Now among these figures, it is not those imprinted on the external sense organs, or on the internal surface of the brain, which should be taken to be ideas—but only those which are traced in the spirits on the surface of the gland . . . (*where the seat of the imagination and commonsense is located*). That is to say, it is only the latter figures which should be taken to be the forms or images that the rational soul, when united to this machine, will consider immediately (*l'ame raisonnable considerera immédiatement*), when it imagines some object or perceives it by the senses. (AT 11:176–77; CSM 1:106)

It is most important to notice the active characterization of the rational soul in this passage. It is the soul that *considers* the forms or images on the gland. Margaret Wilson (1999b, 52–56) has called this Descartes's presentation model of perception. In the axiomatic presentation of the *Second Reply*, Descartes's defines *idea*. He says in Definition II:

> I understand this term to mean the form of any given thought, immediate perception of which makes me aware of the thought. Hence whenever I express something in words, and understand what I am saying this very fact makes it certain that there is within me an idea of what is signified by the words in question. Thus it is not only images depicted in imagination (*non solas imagines in phantasia depictus*) which I call "ideas." Indeed, in so far as these are images in corporeal imagination, that is depicted in some part of the brain, I do not call them ideas at all; I call them ideas only in so far as they give form to the mind itself, when it is directed towards that part of

> the brain (*sed tantum quatenus mentem ipsam in illam cerebri partem conversam informant*). (AT 7:160–61; CSM 2:113)

Here again the mind is depicted as being actively directed toward the brain. The same point is made in the *Fifth Reply* to Gassendi:

> Here you ask how I think that I, an unextended subject, could receive the semblance or idea (*speciem ideamve*) of a body that is extended. I answer that the mind does not receive (*recipi*) any corporeal semblance; the pure understanding of both corporeal and incorporeal things occurs without any corporeal semblance. In the case of imagination, however, which can have only corporeal things as its object, we do indeed require a semblance which is a real body; the mind applies itself to this semblance but does not receive it (*& ad quam mens se applicet, sed non quae in mente recipiatur*). . . . Nor does it understand extension by means of an extended semblance (*speciem extensam*) which is present within it (although it does imagine extension by turning (*imaginetur convertendo*) to a corporeal semblance which is extended. (AT 7:387; CSM 2:265)

Note again the emphasis on the mind's activity. It is not an activity, like an act of Scholastic abstraction, according to which some species or form is taken up from the body and transmitted into the mind; rather the mind *actively turns* to the body to *apprehend* the form in the body. He makes this point earlier in a letter to Mersenne:

> The sense in which I include imaginations in the definition of *cogitatio* or thought differs from the sense in which I exclude them. The forms or corporeal impressions which must be in the brain for us to imagine anything are not thoughts; but when a mind imagines or turns towards (*convertentis*) those impressions (*species*), its operation is a thought. (April 21,1641; AT 3:361; CSMK 180)

Or again, in his interview with Burman, Descartes is asked about the following passage from *Meditation* VI: "If there exists some body to which my mind is so conjoined that it can apply itself to contemplate, as it were, whenever it pleases, it is possible that by this very means I may imagine corporeal things" (AT 7:7; CSM 1:51). Burman sharply asks, "What does 'to contemplate' mean?" Descartes answers: "It is a special mode of thinking, which occurs as follows. When external objects act on my senses, they print on them an idea, or rather, a figure of themselves; and when the mind attends to these images imprinted on the gland in this way, it is said to *perceive*" (*Conversation with Burman*, AT 5:162; Cottingham 1976, 27; CSMK 344–45).

So what is really happening when the mind is actively attending to bodily images? One form of explanation Descartes does not want is that of the mind *looking* at the brain, as if with another pair of eyes:

> Now although this picture [the images that form on the back of the eye], in being so transmitted into our head, always retains some resemblance to the objects from which it proceeds, nevertheless, as I have already shown, we must not hold that it is by means of this resemblance that the picture causes us to perceive objects, as if there were yet other eyes in our brain with which we could apprehend it; but rather, that it is the movements of which the picture is composed which, acting immediately on our mind inasmuch as it is united to our body, are so established by nature as to make it have perceptions. (*Optics* VI; AT 6:130; O 101)

Tad Schmaltz (1997) makes much of this passage and takes "no extra set of eyes" to mean that Descartes cannot find a way to explain how the mind attends to the brain. But seeing is not the only activity of the mind. Indeed it is not a primary mental activity at all. So how may we explain the activity of the mind? Here is one way that Descartes *could* make it work. As we noted in chapter 5, the mind contains a set of innate ideas. Presumably these are created in the human mind by God or learned by experience. Innate ideas, as we have seen in the last chapter, are all general—even if indexical like the cogito—so they are what we may call *kind*-concepts. After Descartes gives up his simple abstractionist epistemology, he argues that because ideas are general, they cannot have arisen from experience or from our body (cf. reply to Gassendi), since every bodily experience is particular. Innate ideas include the whole range of kind-concepts. These innate mental items also include the common notions or eternal truths.

In the mind, these innate general concepts have to be "causally" related to the individual physical motions in the pineal gland that represent the material object being perceived at a given time. Descartes's problem is familiar. How does a particular perception become categorized or conceptualized? At this point the problem becomes more difficult. Simmons (2003) notes this problem and offers an answer in terms of what she calls "constructive judgments":

> There is a second reason for casting these judgments as sensory: they affect the way the world appears to us. They do not immediately result in any beliefs about the world but rather in a sensory experience of it. Constructive judgments of shape do not make me believe that bagels are round; they make bagels look round. Without these constructive judgments of shape, bagels would look elliptical. (567)

Insofar as the sensation is experienced as being of a kind, there is no judgment involving the will (the third type of perception) that results in a belief about how the external world is. But according to Simmons, there is still a problem:

> There remains a problem to solve: how is it that I recognize what is imagistically represented in sensory experience to be an instance of some intellectually understood shape? How, in other words, do I match images with clear and distinct ideas? Descartes has little to say about this, but he does occasionally suggest that images prompt corresponding clear and distinct ideas. (2003, 577 n. 45)

We believe that Descartes has the conceptual resources to solve this problem. The first move, from the mental side, is that the innate kind-concepts in the mind, say of triangle, must become actualized and particularized. In an act of sensible perceiving on a given occasion, a perceiving person must activate the general innate idea of triangle, and she must at the same time become aware of *this* triangle. We could, of course, imagine a triangle, or think of triangle in general and draw upon our common notions to reason about triangles, or we could become aware mentally of a chiliagon. But these would not be acts of the sensory perception of particulars, they would be acts of reasoning about general kinds. For an act of sensation, the content must be of a particular triangle, which, for it to be perception, must be (in some sense) of that same triangular object in the external world that is represented in the pineal gland. This is a general-to-particular relation, where the innate idea contains the particular instance. In this way Descartes still adheres to his doctrine of causal containment.

Now there are three problems before us. First, what causes the innate, general, or kind-concept of triangle to become actualized? Second, how does this innate idea become particularized at *this* time (the time of perceiving)? And third, what is the causal connection between the triangle in the mental idea and the triangle physically represented in the pineal gland? One main principle, which we noted above, that has to govern Descartes's causal thinking is that, for him, the mind is active. This means that mind must do the work. It must be the active principle that forges all these connections. On the occasion *and* at the time of the onset of the active representation in the pineal motion, the mind has to select and activate from its stock of general innate ideas the concept that "fits" the situation. (In this way it functions very much like Aristotle's active intellect; see *De Anima* III 3–7.) In the example of seeing a triangle, the active mind selects and activates the innate generic idea *triangle* because it is a triangle that is at that moment represented in the pineal gland. The problem is how to spell out this "because" (cf. Schmaltz 1997, 47).

Each human mind is aware of *its* body, of the human body that is in union with it. As Spinoza later will enigmatically remark: "The object of the idea constituting the human mind is the body" (*Ethics*, II, Proposition 13). In the case of sensation we are discussing, the mind at this time must perform the particular act that causes it to become aware of this particular state of its body, the human body so intimately related to it. So this mental act must include two aspects: (1) "grasping" the particular representative bodily motions present at that time in the pineal gland, and (2) selecting the appropriate general concept from the mind's stock of innate ideas. These both occur in the same moment, for this causal relation is not sequential. Recall, as we argued in chapter 2, that cause and effect must be simultaneous, and that the effect is present only as long as the cause is acting. This simultaneity may be one reason Descartes sometimes uses phrases such as "on the occasion of."

When all the causal relations are active they constitute the mental act of sensation. In other words, in a moment of time the mind becomes aware of, or, better, creates an attentional awareness of, part of its body (the physical pineal motions representing the particular material object) *as* being in the kind of state that represents an object. So the mind's awareness is now of a physically representing state. However, the mental character of this state is nothing like the physical character of the bodily state. A mental triangle, despite our taking it as representative of a physical triangle, is, by virtue of its being mental, unable to share anything with the physical. As Descartes had said, hearing a word, as a physical act, is nothing like the idea we create of the meaning of the word. An object of consciousness despite being *about* a physical triangle is not itself physical, and so different in kind. Note the parallel here to the perceptual moment of awareness of the cogito. In a moment the mind, by thinking, becomes aware of itself as a particular kind that exists and is thinking. The mind intuits the content of itself as existing thinking. Similarly, the mind can direct itself to its own bodily states and draw the same conclusion. For example, Descartes says, in *Principles* I.9, about the claim "I am seeing or walking, therefore I exist," that "if I take 'seeing' or 'walking' to apply to the actual sense or awareness of seeing or walking [not in a dream], then the conclusion [I exist] is certain since it relates to the mind, which alone has the sensation or thought that it is seeing or walking" (AT 8.1:7–8; CSM 1:195).

Sensation brings together the particularity of *this particular representative pineal motion* with the general kind-concept that is appropriate. The act by which the mind accomplishes perception of its body and of the object represented by its body might well be called *intention*, although Descartes does not call it so. The mind intends as its active function. It creates an awareness of the representative content that is present in the

pineal gland. Minimally, the bodily state functions as a *sine quibus non* cause. But this is not a disguised form of occasionalism. If the bodily content were not present, the mind would have no reason for creating *that* content. What is created by the intentional act between the mind's innate ideas and the content of what is in the bodily pineal motions is an awareness or *mental sensation* in which the particular object being perceived is brought under an innate general concept. In this manner, our sensation of the particular is conceptualized.

This is like Simmons's constructive judgments (see above), except she does not emphasize the particularity or the role of *kind*-concepts that have to be supplied by the innate ideas, nor does she explore the mind-to-body relation. Intending, in cases of sensation, is the relation that directs the mind to re-create as a form of mental awareness the representative content of the motions in the pineal gland. This preservation of representative content requires some sort of identity-defining correlations that are sufficient to explain how a material, external object may be reproduced or represented in the mind as an idea, by the activity of mental intention. The mind takes a part of its (correlated) particular bodily actions (the pineal motions) as an object, but in order to create a sensation the mind must transform what is represented in the bodily motions into an appropriate and correlative mental content. The mind thus becomes a seeing mind and the object becomes, by the identity of the preserved representative content, an object of mental awareness, that is, an intentional object. The identity is an identity of content or objective reality, but not necessarily a resemblance. The mind's innate idea of triangle is intended upon the content of the motions specifying a triangle in the pineal gland that creates the sensible awareness of *this triangle*. This dual movement is necessary for perceptual awareness to bring about any kind of knowledge. There can be no knowledge from experience without conceptualization.

> The perceptions we refer (*rapportons a des choses*) to things outside us, namely to the objects of our senses, are caused (*sont causes*) by those objects, at least when our judgments [opinion] are not false. For in that case the objects produce (*excitant*) certain movements in the organs of the external senses and, by means of the nerves, produce (*excitent*) other movements in the brain, which cause the soul to have a sensory perception of the objects (*lesquels sont que l'âme les sent*). Thus, when we see the light of a torch and hear the sound of a bell, the sound and the light are two different actions which, simply by producing [*excitent*] two different movements in some of our nerves, and through them in our brain, give (*donnent a l'ame*) to the soul two different sensations. And we refer (*nous rapportons*) these sensations to the subjects we suppose to be their causes in such

> a way that we think that we see the torch itself and hear the bell, and not that we have sensory perceptions merely of the movements coming from these objects. (*Principles* I.23; AT 11:346; CSM 337)

Knowledge, however, is always of the general and conceptualized and cannot be solely related to particular things. Thus, particular sensible experience is not proper knowledge just because it is particular. It is a confused idea; confused, because the objective reality of the experience is not clear. We must infer (or make a judgment about) the existence of the external object, which was Descartes's third kind of sensation. In some cases we are not entitled to such inferences. "The clear and distinct ideas of cold, or pain, or color, represents them as sensations or thoughts, and nothing in the idea refers to the hurting, colored or cold body." But what is it that sensations represent, then? Descartes continues, "if one examines the nature of what is represented by the sensation of color or pain—what is represented as existing in the colored body or the painful part—he will realize he is wholly ignorant of it" (AT 8.1:33; CSM 1:217). A clear perception would be of the pineal motions *as* motions; but the awareness is not of the brain, the vehicle of representation, the awareness is of the objective reality or content of the pineal motions (of the brain state).

Yet there is something odd here. We noted that the mind is unable to take the motion of the pineal gland as its object *per se*. Otherwise, on Descartes's view of mind, it would become conscious of that brain motion as a motion. But the mind is not aware qua bodily motion of what is going on in the pineal gland. There is no experience of the pineal gland or its motion. Descartes contrasts this human way of perceiving with that of angels: "For if an angel were in a human body, he would not have sensations as we do, he would simply perceive the motions caused by the external objects, and in this way differs from a real man" (letter to Regius, January 1642; AT 3:493; CSMK 206). No introspection of a human subject's consciousness would find these motions as a mental object or the objective content of a perceptual idea. The mind may be consciously aware of its attached human body and make judgments about the motions that make pineal representations, but it does so by sensing a content and "theorizing" (making judgments or doing science) as it would in regard to any other external body. Such an act of bodily perception of the pineal motions ought to be conscious in the way that all perceptions of external bodies are. In addition, the mind is sometimes aware of some states of its body by conscious feelings, and these may be attributed, by judgment, to a body part, for example, a pain in the foot. We will talk more about these states when we discuss the passions. One possibility for the grasping of bodily motions is that the mind might have an awareness of that motion of the pineal gland unconsciously. There is a hint regarding

this when Descartes writes: "although we are always actually aware of the acts or operations of our minds, we are not always aware of the mind's faculties or powers, except potentially" (AT 7:246; CSM 2:177). And recall what we said in chapter 5 about Descartes's talk of some ideas as present but swamped.

The problems in elucidating the causal bridge of the mind-body gap persuade some philosophers that Descartes's story of this relationship must remain unanswered (e.g., Schmaltz 1997). They claim there is no way to build this bridge, and further that there is no text from Descartes to support any such detail about how such intentional bridging, as we have described it, may occur. About the lack of clear text they may be right. But as we saw, Descartes need not be stymied at this point. One hint comes when he analogizes the mind's relation to the body as being like the mind reading or hearing a word, where the mind becomes aware not of the word *per se* as a printed or spoken object, but becomes aware of the thoughts or ideas that the word means (*Principles* IV.197; AT 8.1:320–21; CSM 284). That is, when the mind reads words it becomes aware of the objective content or meaning of the word, not of the formal reality of the word itself. Margaret Wilson explores this notion in some detail (1999b, 53), but does not really draw out its implications.

This suggests that mind-body identity lies in the nature of representation. Recall that when Descartes speaks of mental representation he is always clear to separate the formal reality from the objective reality. He distinguishes its formal character as a mental entity, an idea, from the objective reality or content of that idea. So too we must distinguish these in the material representation. The formal reality of the motion of the pineal gland just is this motion qua motion, the particular motions of particles. On a given occasion it is *this* motion of *these* particular particles. But remember these motions are specifically coordinated with the motions that lead causally back to their cause, the material object. So the representational content of these motions, on this occasion, is some of the properties of the material object at this time. More generally, Descartes talks as though the motions of certain kinds of objects are correspondent to certain kinds of motions in the pineal gland. So there is both an individual identity and a generic identity that exists among the particles forming the bodylike causal chain from object to brain. It is this identity that allows the next move.

As we have noted, the mind becomes aware of the motions of the pineal gland, but not qua corpuscular motions of a part of the brain, that is, formally. Rather, the mind becomes aware of the motions objectively, becomes aware of their content. It must do so in this way because only the content is *like* the idea. It is as though the pineal motions, being specific to the object that causally gives rise to them, are transparent. This rela-

tion, as we have claimed before, is one of transparent intentionality. The mind sees the object by becoming aware of the objective representation in the gland. In this sense the material object is the direct exemplar cause of what the mind sees (see chapter 3). The exemplar cause of an innate idea is the "same" idea in the mind of God. But God also created the object as being a kind of object, having the formal properties that it has, and so God is the exemplar of the object too. Both the innate idea and object have the same exemplar cause. They share an identity. The nature of the material object and the nature of the innate idea are the same, not qua material or mental, for these are different, of course. Yet they are the same by nature, which means they have the same objective reality or content, in both instances. Furthermore, the material object preserves, as we have spelled out, its objective reality through the transformations of motions from object to pineal gland.

What is still missing is the warrant for the identity of the objective content of the motions of pineal gland and the mind's occurrent sensation of its body qua content. So let us talk now about warranting identity claims. In the world of material bodies, as we find it in Descartes's later work, the identity of motion-carrying content is warranted by God's conservation. Just as in collisions between bodies where God conserves the quantity of motion among the colliding particles, so in acts of perception he conserves the content identity among the motions from object to pineal gland. This conservation relation is part of the causal harmony picture we outlined in chapter 2. Moreover, it allows us to conceive of a body's duration as the same body despite changes in its motion. Regulated quantity of motion is the way identity is kept among states of bodies as they interact, a way of relating their sizes and speeds. It is our human way of making the world epistemically intelligible, our way of doing science. In the case of collisions, if God did not conserve motion, then human knowledge would be impossible because no equilibrium among states could be given; without such equilibrium states as goal states, no equations could be solved. We would have no way of telling what one body does to another. And further, given that the identity of a body depends upon its differential motions, we would end up having no criteria for identity of single bodies. There could be no human knowledge of motion. This way of putting the point brings out the teleological and epistemic character of the collision laws.

Similarly, without the identity of content conservation among the material motions in perception, no knowledge would be possible. Furthermore, without the identity conservation carried by the specific correlation among the motions (material and mental), there would be no way for the mind to grasp the motions in the pineal gland, as in an act of seeing. It is the mind that becomes aware of its own state in the form of a conscious,

sensible experience that comprises both the nature of an innate idea and the nature of the material object, the content of the pineal motions taken as intentional. It is not sufficient for Descartes to say that these mind-body relations are just instituted by nature. This would be tantamount to accepting a version of occasionalism, for it would be only to claim that by our nature the mind and the body act in tandem, which is of course due to God and the manner in which he made us. But God, on Descartes's picture, made the mind active, and it is our mental act of intention that takes us away from God's direct intervention, and so saves us from occasionalism. The mind must act to conceptualize the content of our experience; it is not merely given to us.

The active power of the mind, in creating the identity of mental content from the content from physical motions, is what constitutes the special intentional relation between a mind and its own body. This activity of the mind during perception should not be confused with the active principle that is the individual's will, which is what was dismissed in *Meditation* VI, because we cannot will (or control) what or when sensible experiences come. They are adventitious. The active principle is the understanding, and lies in the activity of the mind's use of its innate general ideas. When the body gets involved through sensing, there is no clarity, only the confusion that attends to sensation. "Sensations such as pain are not pure thoughts of a mind distinct from body, but confused perceptions of a mind really united to one" (to Regius, January 1642; AT 3:493; K 127–28).

Or again from *Principles* IV, article 190:

> Moreover other movements of these small nerves [around the heart and praecordia] cause (*efficiunt*) other states (*affectus*); for example, love, hatred, fear, anger, etc. insofar as these are only states or passions, of the rational soul (*quantenus sunt tantum affectus, sive animi pathemata*). That is, insofar as they are certain confused thoughts (*confusae . . . cogitationes*) which the mind does not have from its own nature (*non habet a se sola*) but rather, because something is being experienced (*aliquid patiatur*) by the body to which the mind is closely conjoined. (AT 8.1:317; M 277–78)

Given the causal connections we have outlined thus far, we can assert that the occasion of a representative pineal motion is quite literally a proximate cause of the mind's action. The causal relation holds between the kind of motion present in the pineal gland (e.g., triangle-representing motions) and *this* occasion of *this* triangular type of motion being present there at this time, and the innate concept of triangle that is selected on this same occasion (at this same time) by the mental act of intending that physical motion. The causality here, as always, is carried through the connection between the general or kind-concepts; in the triangle example,

it is between the physical motion and the innate idea of triangle that is brought into play to connect the physical triangle as represented by the physical motions and the concept of triangle. Furthermore, the material triangle and its representation in the physical motions of the pineal gland both serve as an exemplary cause for the mind's active use of the innate general concept appropriate to the content that is intended in the realm of the physical. The possibility of such representation-preserving transformations, or identities, is warranted by God's harmonious re-creation of the world, and by the fact that God re-creates the world in such a teleological way that *human* knowledge of the material world is possible. In this way, the body-mind relation is part of that teleological system. The system is comprised of two dependent created substances, mind and body, that are related in the closest way possible, by a shared identity of representative content brought about by intentionality. In this way the two are brought together to make a substantial union, a whole.

> The hand is an incomplete substance when it is referred to the whole body of which it is a part; but it is complete substance when it is considered on its own. And just in the same way the mind and the body are incomplete substances when they are referred to a human being which together they make up; but if they are considered on their own, they are complete. (*Fourth Reply*, AT 7:222; CSM 2:157)

Since the mind is active and the body passive, the mind is like the form of body. This form-matter relation explains why Descartes often uses the analogy of the Scholastic real quality of heaviness as an incorporeal substance that causes bodies to fall when he explains the mind-body union (for example, to Arnauld, July 1648, AT 5:222; CSMK 358).

Because the mind's intending on a particular temporal occasion is teleologically and causally related to a particular material object, the mind is impelled to make a judgment that the external object exists at that time. The act of intending, as it were, impels the mind (as will) to make the additional judgment regarding the existence of the object represented. This is the third grade of perception that we mentioned above (see Simmons 2003, 568ff.). In the case of veridical perception, this judgment is correct. The perceiver sees the object, and the object is a cause of the perception. (This is one conclusion of *Meditation* VI.) In such a mental act, when the appropriate representative character is not preserved, the mind makes a judgment that is false, as we saw in the case of a color or a pain. It may make the mistake because it is overhasty, or because it is has not learned, by studying science, what to intend, or which innate concept to select, or has not learned the limits of its knowledge. In other cases, the mind by taking the pineal motions as an object, gets information about the world, most notably information about what is relevant to pre-

serving the mind-body union; for example, certain extensional properties of the ripe tomato get represented in the mind as bright red by virtue of the motions of the particles and conceptualized as edible (see *Meditation* VI). This in turn impels the mind to cause the body to eat the fruit. A final type of case is where in fact there is no actual intention of an existing physical object, even though the mental imagining is like what would have occurred if there were. In this case, the mind does not really use the body to perceive. The mental sensation is generated in the imagination by internal mental causes and the bodily repositories of memory. Such is the case when we imagine, or have memory images, and perhaps when we dream. But these phenomena, as we learned as far back as *Meditation* VI, can be detected as false by looking at how well they cohere with what else we have learned. And as we saw above, this cohesiveness is just the reflection of the harmonious union of our mind and body, and its relation to the rest of the material world. In fact, this cohesiveness is why perceptual experience is necessary for doing science.

How the Soul Moves the Body, or Mind-to-Body Causation

Now it may seem strange that the mind can act upon the body, through its intending or in any other way. But this is certainly what Descartes believes. He holds that the mind, through its intentions, can command the body to move, to act, and can use the body as a tool to do its bidding, as when willing its body's arm to be raised. Moreover, this is how some of the emotions work. Mind-to-body causation gets the doctrine of the perfection of causal relations going the right way, from higher perfection to lesser. It highlights the active nature of mind versus the passive nature of body. As we saw in sensation, the perceiving mind grasps the objective content that is appropriate to this occasion and to this kind of bodily motion. In doing so, it turns the content of the pineal bodily movements into the objective reality of an idea. The mind's grasping the content of the pineal motions just is the forming of a particular intention vis-à-vis a perceptual object. The mind in its form of awareness, that is, a conscious idea, of a particular content (objective reality) becomes the form for what was instantiated in the bodily motions. The physical motions by means of the mental act of intention become information, as it were. Thus, this act of mind is the form of that part of the body on this occasion. But we must emphasize again, as we discussed above, that this is a real causal relation, and not any form of occasionalism. Recall too, just to emphasize the relation, that the content of the motions, what they represent, in the human body and, thus, in the mind, is directly caused, in part, by the material object. The mind after perceiving may think about what it has

grasped or may act upon it; in either case it brings to bear its common notions and what it has learned.

In the following passage Descartes pulls together the main points we have been discussing:

> Next, it is proved that the nature of our mind (*nostrae mentis naturam*) is such that, simply from the fact that certain movements occur in a body, it can be driven (*possit impelli*) to all sorts of thoughts (*quaslibet cogitationes*), which convey no image of these movements (*nullam istorum motuum imaginem referents*); and especially to those confused thoughts which we call feelings (*sensu*) or sensations (*sensations*). For we see that either spoken or even written words can excite any thoughts or stirrings whatever in our mind (*quaslibet in animis nostris cogitationes & commotiones excitare*). . . . It will perhaps be replied that writing or speech does not excite states (*nullus affectus*) and images (*imaginations*) of things different from itself directly (*immediate*) in the mind, but only diverse understandings (*sed tantummodo diversas intellectiones*); on the occasion (*occasione*) of which the soul itself {which understands the meaning of these words}, forms in itself (*anima ipsa . . . in se efformat*) images of various things. But what will be said of the feelings of pain and titillation? A sword applied to our body, cuts it: from this alone pain is produced (*ex hoc solo sequitur dolor*), without thereby indicating to us what the movement or figure of the sword is. The idea of this pain is obviously as different from the local motion of the sword or of the body which is cut, as is [the idea of] color, sound, odor, or flavor. And since we see clearly that the feeling of pain is excited in us solely (*in nobis excitari ab eo solo*) by the fact that some parts of our body are locally moved (*localiter moveantur*) by contact (*contactu*) with some other body, we can on that account conclude (*licet concludere*) that our mind is of such nature (*talis naturae*) that, from some other local motions, it can have the experiences (*affectiones pati possit*) of all the other feelings (*sensuum*) [and sensations]. (*Principles* IV.197; AT 8.1:320–21; M 281)

Again in mind-to-body causation the active mind or soul takes the body as its object, and makes an intentional volition regarding the body. So the soul, intending a part of the body, for example, an arm, as an object, wills itself to move that arm. It moves the arm by unintentionally moving the gland that sends the right motor spirits to the nerves of the arm. In this way, as in perception, there is a transparent intentional connection between the soul and the body part it wills to move. Furthermore, the ability of the soul to move a body part illustrates the tight, substantial mind-body connection, for whereas the soul also can perceive or intend an external

corporeal body, say a rock, it cannot produce an effective volition to move the rock (in the way it moves the hand). It, of course, may will the hand to grasp the rock, and so move it in that way.

In the same manner, the soul may produce more complex movements in the body. So for example in *Passions* I, article 40, Descartes writes:

> For it is necessary to notice that the principal effect of all the passions in men is that they incite and dispose (*incitent & disposent*) their soul to will the things for which they prepare the body, so that the sensation of fear incites it to will to flee, that of boldness to will to do battle, and so on for the rest. (AT 11:359; CSM 1:343; V 40–41)

He elaborates in the next article, 41:

> But the will is by its nature free in such a way that it can never be constrained. . . . [There are] two sorts of thoughts I have distinguished in the soul . . . its actions . . . volitions and . . . its passions . . . perceptions . . . the former are absolutely in its power and can only indirectly be altered by the body, whereas the latter depend absolutely on the actions that produce them (*dependent absolutment des actions qui les produisent*) and can only be indirectly altered by the soul. . . . And the whole action of the soul consists in this: merely by willing something, it makes the little gland to which it is closely joined move in the way required to produce the effect corresponding to this volition. (AT 11:359; CSM 1:343; V 41)

Yet there are even more complex feedback relations between the mind's activity on the body, and the body on the mind. Consider what Descartes says about the causal mechanism of fear:

> [If the soul sees that] this shape is very unusual and frightful, that is if it bears a close resemblance to things that have previously been harmful to the body, this excites the passion of apprehension in the soul. . . . [The soul] sends spirits to the brain suitable to maintain and strengthen the passion of fear—that is, suitable to hold open or reopen the pores of the brain that guide them to the same nerves. Simply in virtue of entering these pores, these spirits excite a particular movement in this gland which is constituted by nature to make the soul feel this passion. (I, art. 36; AT 11:356; CSM 1:342; V 39)

But this action of the soul on the body gets completed by the body's sending back to the soul another motion, giving rise to another idea—a feeling.

> Just as the course which the spirits take to the nerves of the heart suffices to induce a movement in the gland though which fear enters the soul, so too the mere fact that some spirits at the same time pro-

> ceed to the nerves which serve to move the legs in flight causes (*ils causent*) another movement in the gland through which the soul feels and perceives this action (*le moyen duquel l'âme sent & apercoit cette fuite*). (I.38; AT 11:358; CSM 1:342–43; V 40)

The Nature of the Distinction between Mind and Body

Before considering Descartes's view on the mind-body union, we need to explore changes in the way in which he draws the distinction between the mind and the body. As we noted in chapter 3, he first alludes to the mind-body distinction using the term "substance" in the *Discourse* (1638), but does not argue for the distinction until the *Meditations* (1641). In *Meditation* VI, he presents a very clear and strong argument:

> First, I know (*scio*) that everything I clearly and distinctly understand (*intelligo*) is capable of being created by God so as to correspond exactly with my understanding of it (*talia a Deo fieri posse qualia illa intelligo*). (AT 7:78; CSM 2:54)

Notice first the use of unqualified words to describe his state of knowledge: *scio* and *intelligo*. He continues in the same secure vein:

> Hence the fact that I can clearly and distinctly understand (*intelligere*) one thing apart from another is enough to make me certain (*certus*) that the two things are distinct. . . . Thus simply by knowing that I exist (*sciam me existere*) and noticing (*animadvertam*) at the same time that absolutely nothing else belongs to my nature or essence except that I am a thinking thing, I can infer correctly (*recto concludo*) that my essence consists solely in the fact that I am a thinking thing. . . . on the one hand I have a clear and distinct idea of myself insofar as I am thinking thing; and on the other hand I have a distinct idea of body, insofar as this is simply an extended, non-thinking thing. And accordingly, it is certain (*certum*) that I am really distinct (*revera esse distinctum*) from my body, and can exist without it. (AT 7:78; CSM 2:54)

This unqualified argument is repeated again in the *Second Reply* in the axiomatic (synthesis) presentation. This time Descartes puts his claim in terms of the concept of substance:

> Now if one substance (*Jam vero substantiae*) can exist apart from another, the two are really distinct [Definition X]. But the mind and the body are substances (Definitions V, VI, and VII) which can exist apart from each other. [For God could make that happen.] Therefore there is a real distinction (*realiter distinguntur*) between the mind and the body. (AT 7:170; CSM 2:120)

Later, when pushed by his critics, he hedges a little, qualifying his understanding of the mind-body distinction and how he knows it. This occurs in his *Fourth Reply*, and not surprisingly it is Arnauld who brings it out. The context is where Descartes defends his claim that a real distinction cannot be inferred, by means of abstraction, from the fact that one thing is conceived apart from another. Abstraction conceives a thing inadequately. A real distinction can be inferred only if we understand one thing completely, or as complete thing, and as being apart from another (AT 7:1 220; CSM 2:155; and see our earlier discussion on abstraction versus exclusion in chapters 1 and 5). Descartes makes this claim in responding to the *First Objection*, where, for the first time, he takes pains to get clear on the kinds of distinctions (invoking Suárez as support) (AT 7:120; CSM 2:85–86). In qualifying his claim in the *Fourth Reply*, he writes:

> I do not, as M. Arnauld assumes, think that adequate knowledge of a thing is required here. . . . A created intellect, by contrast [with compete and adequate divine knowledge], though perhaps it may in fact possess adequate knowledge of many things, can never know it has such knowledge. In order to have adequate knowledge of a thing all that is required is that the *power of knowing possessed by the intellect is adequate for the thing in question*, and this can easily occur. But in order for the intellect to know that it has such knowledge, *or that God put nothing in the thing beyond what it is aware of*, its power would have to be equal to the infinite power of God, and this plainly could not happen on pain of contradiction. (AT 7:220; CSM 2:155; emphasis added)

In the *Meditations*, it seems we can know how God made the world, and that epistemic limitations on our knowledge are confined to knowledge based on sensations. The argument for a material world and the active powers of material objects suggests that we could have certain knowledge of the ontic structure of the world in terms of the substances that comprise it. But in this last quotation, since to know what God can do requires knowing that one knows, Descartes backs off his claims to certain knowledge, but still insists that we have sufficient knowledge, that is, knowledge adequate for our cognitive purposes.

Why does Descartes introduce the notion that God could put properties in a thing that a created intellect is unaware of? He elaborates on this limitation concerning adequate knowledge in terms of the real distinction:

> Now in order for us to recognize a real distinction between two things, it cannot be required that our knowledge of them be adequate if it is impossible for us to know if it is adequate. And, since, as has just been explained, we can never know this, it follows it is not necessary for our knowledge to be adequate. (AT 7:220; CSM 2:155)

The upshot is that created intellects must draw real distinctions on the basis of not knowing whether or not they have adequate knowledge.

Writing to Gibieuf in 1642, Descartes raises the same problems. At this point he is still considering the establishment of knowledge by abstraction. "I merely look to see whether I have derived it, not from something outside me which is more complete, but by an intellectual abstraction from some other richer more complete idea which I have in myself" (AT 3:475; CSMK 202). He then argues that we can tell whether an idea is incomplete or inadequate by abstraction, which shows us that "the idea of a substance with extension and shape is a complete idea . . . It seems to me very clear that the idea I have of a thinking thing is complete in this sense, and that I have in my mind no other idea prior to it and joined to it in such a way that I cannot think of the two together while denying the one of the other; for if there were any such within me, I must necessarily know it" (ibid.). Here he is using "incomplete" and "inadequate" as synonyms. However, considering a possible objection to what he has just said, he writes:

> You will say perhaps that the difficulty remains, because although I conceive the soul and the body as two substances, which I can conceive separately, and which I can deny of each other, I am still not certain that they are such as I conceive them to be. Here we have to consider the rule already stated, that we cannot have any knowledge of things except by the ideas we conceive of them; and consequently, that we must not judge of them except in accordance with these ideas, and *we must even think that whatever conflicts with these ideas is absolutely impossible and involves a contradiction.* Thus we have no reason to affirm that there is no mountain without a valley, except that the ideas of these things cannot be complete when we consider them apart; though of course by abstraction we can obtain the idea of a mountain, or of an upward slope, without considering that the same slope can be traveled downhill. (AT 3:476–77; CSMK 202; emphasis added)

Here the complete idea of soul and body as two substances is tested by means of the contradictions that follow when we affirm one and deny the other. Yet Descartes limits his claim, in the light of God's immense power:

> I do not know that God has not united or joined them [soul and body] together so tightly that they are entirely inseparable. I would reply that however he may have joined them, I am sure he can also disjoin them; so that absolutely speaking I have reason to call them divisible, since he has given me a faculty of conceiving them as such. I say the same about the soul and the body and in general about all

> things of which we have distinct and complete ideas; that is, their being inseparable involves a contradiction. But I do not on that account deny that there can be in the soul or body many properties of which I have no idea; I deny only that there are any which are inconsistent with the ideas of them that I do have, including the ideas that I have of their distinctness. (AT 3:477–78; CSMK 203)

At this time in 1642, he is not sure exactly how to elaborate the test of contradiction. Yet he seems committed, at this point, to believing that if he can conceive a contradiction in his thought, then nothing in created reality could correspond to that. That is, he still thinks his thought about generic kinds can, to some degree, tell us about aspects of reality.

In the *Principles* (1644), Descartes begins to develop an epistemic stance with regard to the mind-body distinction that seemingly contrasts with what he had said in the *Meditations*. Indeed, *Principles* I, article 63, introduces many epistemic qualifiers, and has a marked change in tone and degree of certainty:

> Thought and extension can be regarded (*spectari possunt*) as constituting the nature of intelligent substance and corporeal substance; they ought to be conceived (*concipi debent*) as nothing else but thinking substance and extended substance—that is as mind and body. In this way they will be clearly and distinctly known (*intelliguntur*). Indeed, we know more easily (*facilius intelligimus*) extended substance or thinking substance than substance alone . . . For we have some difficulty in abstracting the notion of substance from the notions of cognition and extension, since the distinction between these notions and the notion of substance is merely a distinction of reason (*rationis*). A concept is not any more distinct because we include less in it; its distinctness depends on our carefully (*accuraté*) distinguishing what we do include in it from anything else. (AT 8.1:30–31; CSM 1:215)

As we noted above, in chapter 5, Descartes now emphasizes what *we* may know, namely, the attributes of extension and thought, rather than substance itself. This is the principal-attribute reading, and Descartes is using it here to make a strong epistemic claim about the manner in which we know substance. Thinking and extension are general attributes, which perhaps we cannot understand fully because of their generality, so what would happen if we considered them as instantiated in particulars? Descartes entertains this supposition in a surprising way when, in the *Principles*, he says that you could also think of the mind-body distinction in terms of modes:

> Thought and extension may also be taken (*sumi etiam possunt*) as modes of substance, in so far as one and the same mind is capable of having many different thoughts; and one and the same body, with its quantity unchanged, may be extended in many different ways. . . . The distinction between thought or extension and substance will then be a modal one; and our understanding of them will be capable (*possunt intelligi*) of being as clear and distinct as our understanding of the substance itself. . . . By regarding them as being instances of which they are modes, we distinguish them from the substances in question and see them for what they really are. If on the other hand we attempted to consider them apart from the substances in which they inhere, we would be regarding them as things which subsisted in their own right, and thus would be confusing the ideas of mode and substance. (Art. 64; AT 8.1:31; CSM 1:215)

Then he goes on:

> There are various modes of thought . . . and . . . various modes of extension . . . we shall arrive at the best perception (*optimé percipiemus*) of all these items if we regard (*spectemus*) them simply as modes of the things in which they are located. (Art. 65; AT 8.1:236; CSM 1:216)

The main argument here is, as it was above, that an attribute or a mode must be an attribute or mode of some substance. Presumably, were they not, we would be countenancing substantial forms, entities that could exist on their own. The argument continues; since the two attributes—extension and thought—are distinct, they must belong to two different substances. And so there is a real distinction between the substance mind and the substance body.

However, Descartes complicates the picture:

> strictly speaking a real distinction exists only between two or more substances; we can perceive that two substances are really distinct simply from the fact that we can clearly and distinctly understand one apart from the other. . . . And even if we suppose that God has joined some corporeal substance to such a thinking substance . . . [t]hus compounding them into a unity, they nonetheless remain really distinct. For no matter how closely God may have united them, the power which he previously had of separating them . . . is something he could not lay aside; and things which God has power to separate, to keep in being separately, are really distinct. (*Principles* I.60; AT 8.1:29; CSM 1:213)

Here again there seems to be a realistic commitment that contrasts with the epistemic qualifiers that what we noted above. Yet Descartes is begin-

ning to worry about the mind-body unity, and how this will affect the status of the real distinction. Here he does not talk about contradictions, but instead invokes a strange premise that moves from possibility to actuality. If God possibly could have made two substances distinct, then the substances really are distinct, that is, separate in reality. Perhaps he considers this as just the negation of his other modal claim: if something is impossible, then it is not actual.

The distinction between an attribute and its substance is only a distinction of reason, Descartes asserts:

> Finally distinction of reason (*distinctio rationis*) is a distinction between a substance and some attribute without which the substance is unintelligible (*intellegi non potest*) . . . [and this is] recognized by our inability to form a clear and distinct idea of the substance if we exclude from it the attribute in question. (*Principles* I.62; AT 8.1:30; CSM 1:214)

So if there is to be a real distinction, it must be drawn between substances, but we do not know the substances of mind and body in and of themselves, but only through their principal attributes of thought and extension. But the distinction between the attribute of thought and the substance we conceive through it, and the attribute of extension and the substance conceived through it, are only rational distinctions. So there is no direct warrant for a real distinction, since these substances are not known *by us* directly but only through their principal attributes. But we conceive the attributes as distinct, and so, as we noted above, God could have made the substances really distinct. So presumably Descartes also holds that if we understand two attributes as possibly distinct, then the substances that have those attributes have been made distinct by God. A letter to Mesland in 1644 shows Descartes clearly rethinking the implications of his contradiction criterion and reflecting on the nature of possibilities when it comes to attributing actions to God and concluding things about reality. He writes:

> I turn to the difficulty of conceiving how God could have been acting freely and indifferently if he had made it false that the three angles of a triangle were equal to two right angles, or in general that contradictories could not be true together. It is easy to dispel this difficulty by considering that the power of God cannot have any limits, and that our mind is finite and so created to be able to conceive as possible the things which God has wished to be possible, but not to conceive as possible things which God could have made possible, but which he has nevertheless wished to make impossible. . . . I agree that there are contradictions so evident that we cannot put them before our

> minds without judging them entirely impossible, like the ones which you suggest: "that God might have brought it about that his creatures are independent of him." But if we know the immensity of His power we should not put these thoughts before our minds, nor should we conceive any precedence or priority between his intellect and will. (May 2, 1644; AT 4:118–19; CSMK 235)

The contrast here is between our limited, finite mind and God's infinite intellect (and will). But the difference plays itself out in what we conceive as contradictory, and in what we may infer from having contradictory ideas. Here Descartes claims we may conceive as possible what God wished to be possible. Yet since our thought cannot encompass what God could do, he could have done things that to our minds would seem impossible. Such cases would show up as a contradiction in our thought. From this it follows that what is contradictory for us is not a test of a judgment about how God created the world, or how the world really is, or about the true nature of things. Contradictions show us only the limitations of our cognitive powers. This is a clear shift emerging in Descartes's epistemic perspective and it reflects back to the epistemic caveats he raised in the *Principles*.

Six years later, in 1648, Descartes writes to Arnauld that a vacuum is inconceivable though we may not notice that it is a "contradictory conception":

> I do not think that we should ever say of anything that it cannot be brought about by God. For since every basis of truth and goodness depends upon his omnipotence, I would not dare say that God cannot make a mountain without a valley, or bring it about that 1 and 2 are not 3. I merely say he has given me such a mind that I cannot conceive a mountain without a valley, or a sum of 1 and 2 which is not 3; such things involve a contradiction in my conception. (AT 5:224; CSMK 358–59)

This passage emphasizes the change. Descartes no longer believes that the contradiction test shows what can or cannot be in the world. God's omnipotence precludes such certainty on our part. All we can say is what we find contradictory, and of course that is a test solely of our understanding. Perceived contradictions exhibit our limited cognitive understanding, and contradictions are part of the "rules" of thought by which we know the world. Yet Descartes is not flirting with idealism. There is a real world; and we are able to know it in a way that comports with the epistemic harmony God has established and maintains in virtue of his continual re-creation.

Descartes appears to add yet another nuance to the mind-body distinction. The context is one in which he explains the difference between the simple and the composite:

> A composite entity is found to have two or more attributes, each one of which can be distinctly understood apart from the other. For from this, that one without the other is understood (*intelligatur*), it is known (*cognoscitur*) that this is not a mode, but is a thing, or an attribute of a thing, which can subsist without the other. . . . But that which we consider (*consideramus*) as having at the same time both extension and thought is a composite entity, namely a man—an entity consisting of a soul and a body. (*Comments on a Certain Broadsheet*; AT 8.2:350–51; CSM 1:299)

So the final conclusion is that we can best understand mind as distinct from body in terms of their being different attributes. But we may also consider them as related in a composite entity, a man, where thought and extension together may be conceived as a composite entity having a soul-body attribute. This latitude that Descartes allows in regard to how we conceive soul and body suggests that reflecting on the mind-body union does not require that we even treat them as distinct. Clearly, in this late period, talk of substance and attribute, and what God can possibly do or not do, will not allow one to conclude how God actually created the world. We are not suggesting, however, that Descartes no longer accepts a substance-attribute ontology. Nor are we suggesting that the mind and the body are not distinct for Descartes. Certainly, he continues to think that thought and extension are general concepts that can be really distinct in our understanding, so that the particular modes of each will also be distinct. Our point is that for epistemic purposes we are able to conceive substances only under their principal attributes or under their respective modes. If this reading is right, then it is important to notice that Descartes allows his mind-body distinction to be described in different ways depending upon context, and upon how the distinction is being used to foster human understanding and, as we shall also see, for understanding humans.

The texts just examined show that Descartes is exercised in his later thought by a profound opposition between what we can know in terms of clear, distinct, and noncontradictory ideas and a reality created by God's boundless omnipotence that lies beyond our comprehension. Second, he is mindful that the real distinction is a product of reflectively drawing out from the particular content of the cogito, as performed at a specific time, a generic distinction between mind and body, so that we come to know that mind is a nonextended thinking thing and body is nonthinking extended thing. These reflectively exclusive concepts direct our thought

about mind and body, and constrain how we think about each separately on the pain of contradiction. But as noted above, we may also think of the two together, as a composite, where the exclusion between them breaks down. But in every case, we are thinking about our ideas, which are epistemic concepts, which nevertheless have some foundation in reality—otherwise God would be a deceiver. But no one way of thinking exhausts the real and allows us to infer how God really made the world.

The Mind-Body (Soul-Body) Union

Daniel Garber points to an uneasy tension in Descartes's thought about the mind-body union, and we have explored some its aspects in the preceding section. Garber rightly claims that this tension has led people to adopt a variety of different positions concerning Descartes's view of the mind-body union. There are those who support substance dualism, or attribute dualism, and others who support a view, called trialism, in which the mind-body union forms a third distinct substance or attribute. Garber argues that both dualism and trialism are found in the *Principles*, and that Descartes's talk of a substantial union, the idea that mind and body are united *per se* and not *per accidens*, and the claim that the soul is the substantial form of the body, must be taken seriously and sit uneasily with the standard dualist interpretations (Garber 1992, 89). We agree with Garber, but wish to push further.

In our view, the dispute between the dualists, the interactionists, and the trialists is misconceived because all parties treat the concepts of mind and body as requiring direct ontological reference. They also assume that Descartes is concerned from first to last with upholding, always in the same way, a real distinction between mind and body. The ontological problems that arise from such treatments have been well sorted out by Marleen Rozemond (1998, 172–213). The ontological approach works, for reasons explained in the last section, for *Meditation* VI and perhaps even the *Principles*.

We wish to explore, however, yet another change in Descartes's views that bears on the status of this distinction, and which has been little discussed in the literature. After finishing his *Replies to the Objections* to his *Meditations*, Descartes is asked by many of his correspondents about the nature of the mind-body union. This question comes up most famously in the correspondence with Princess Elizabeth of Bohemia, who writes to Descartes on May 6, 1643, asking how the soul, being only a thinking substance, can determine the body to act. The ensuing problems that Descartes considers terminate in the writing of his final work, *The Passions*

of the Soul. So during the post-*Meditation* period up until his death he has cause to think more thoroughly about the nature of the mind-body union and the problems that arise in trying to explain it. During the eight years he works on the problem of the union, Descartes fails sufficiently to keep apart two overlapping, but separate distinctions, namely, between *mind-body* and *person-body*. The *person-body* distinction is often signified when Descartes changes from talking about *mind* to talking about *soul*, though, of course, he had talked about soul earlier when he was concerned to discuss its immortality. But what Descartes begins to see, perhaps more clearly than he had previously, is that the conception of the person—the mind-body union—is central to a number of questions he seeks to answer, for example how the passions work. And in this respect, the real distinction between the mind and the body is not of great importance. Indeed, if the concept of the person as a whole is basic in some contexts, then in those contexts the mind-body distinction can only be drawn by abstraction. In this way, he comes to appreciate, as a result of Elisabeth's prodding, that our conception of the whole person ought to constrain how we conceive the mind-body distinction. Certainly, he realizes that he can't remain content with the manner in which that distinction is introduced in *Meditation* VI and the concept of the person that it implies. There the notion of the "self," of his person, Descartes equates solely and essentially with a thinking, nonextended thing that can exist apart from his body (AT 7:78; CSM 2:54). But the conception of the person involved in the mind-body union is that of the substantial self, a notion much more complex than a mind that thinks.

Throughout his work Descartes takes the concept of *mind* to signify a thinking thing and its modes, that is, thoughts or ideas, though sometimes mind includes the active abilities of will and judgment. *Soul*, by contrast, is a much broader concept, and is used when discussing the nature of a person, personal identity, and agency, as well as in certain epistemological contexts. Descartes's discussions of the distinction between mind (soul) and body seem to reflect tensions as to the rather different purposes he has for making the distinction in the context of describing the union. We shall try to make plausible the idea that Descartes's work on the union of the soul and body forces him into the more epistemic way of drawing the mind-body distinction that we outlined in the last section. In his treatment of mind and body as a substantial union constitutive of the nature of person, he begins to downplay any need for maintaining a strict and direct ontological distinction between mind and body.

Let us now look at some of the relevant texts so that we may carefully follow his thinking. Just after finishing his *Replies* to the *Meditations*, Descartes worries about the nature of the mind-body union:

> the mind is united in a real and substantial manner to the body . . . by a true union. You could so [explain this], as I did in my *Metaphysics* [*Meditations*], by saying we perceive that sensations such as pain are not pure thoughts of a mind distinct from a body, but confused perceptions of a mind really united to a body. (To Regius, January 1642; AT 3:493; CSMK 206)

We discussed how sensations work for Descartes earlier in this chapter, and so there is no need to repeat the analysis here. But notice that it is sensations that reveal immediately that the union is real and substantial

This new emphasis may also be seen in 1643 when Princess Elizabeth questions him about the mind-body (soul-body) relation. Descartes answers:

> First I observe that there are in us certain primitive notions which are the originals on the model of which we form all our other knowledges (*qui sont comme des originaux, sur le patron desquels nous formons toutes nos autres connoissances*). There are very few such notions. First, there are the most general ones, such as being, number, and duration, which apply to everything we can conceive. Then, as regards body in particular, we have only the notion of extension which entails the notions of shape and motion; and as regards soul in particular we have only the notion of thought, which includes the conceptions of the understanding and the inclinations of the will. Finally, as regards soul and body together, we have only the notion of their union, on which depends our notion of the soul's power to move the body, and the body's power to act on the soul and cause sensations and passions. (May 21, 1643; AT 3:665; CSMK 218)

Here Descartes stresses the point that the notion of the union is irreducibly primitive, and gives form to our thought, and constitutes a new class of innate ideas, as we discussed above. The notion of the *soul-body* union is now on a par with the intellectual common notions of duration and number and our notions of the attributes extension and thought. And it should be recalled that *understanding* requires an active mind in order to account for intellectual as well as sensory knowledge.

Descartes tries to explain further the obscurity of the union of the mind-body to Elizabeth in June 28, 1643, and in so doing switches from "mind" to "soul":

> It does not seem to me that the human mind is capable of forming a very distinct conception of both the distinction between the soul and the body and their union; for to do this it is necessary to conceive them as a single thing and at the same time to conceive them as two things; and this is absurd.

> Your Highness observes that it is easier to attribute matter and extension to the soul than to attribute to it the capacity to move and be moved by the body without having such matter and extension. I beg her to feel free to attribute this matter and extension to the soul because that is simply to conceive of it as united to the body. And once she has formed a proper conception of this and experienced it in herself, it will be easy for her to consider that the matter she has attributed to thought is not thought itself, and that the extension of this matter is of a different nature than the extension of thought. . . . And so your Highness will easily be able to return to the knowledge of the distinction between the soul and the body in spite of having conceived their union. (AT 3:693–94; CSMK 227–28)

When Descartes tells Elizabeth "feel free to attribute extension to the soul" he is clearly allowing her great epistemic latitude so that she may better conceive the nature of the union. But when we think intellectually, using the mind alone, about the nature of mind and the nature of body, we need to think of the concepts as mutually excluding one another. As we shall see shortly, problems arise with the idea of mutual exclusion when Descartes considers the cognitive access we have to the union.

Later, he describes the union in terms of the personal identity that the soul provides:

> Nobody denies that we have the same bodies as we had in infancy, although their quantity is much increased, and according to the common opinion of natural philosophers, which is doubtless true, there is no longer in them any part of the matter which then belonged to them, and even though they no longer have the same shape; so that they are numerically the same only because they are informed by the same soul. Personally, I go further. I have examined the circulation of the blood, and I believe that nutrition takes place by a continual expulsion of parts of our body, which are driven from their place by the arrival of others. Consequently I do not think that there is a particle of our bodies which remain numerically the same for a single moment, although our body, qua human body, remains always numerically the same as long as it is united with the same soul. In that sense it can even be called indivisible. (Letter to Mesland, February 9, 1645; AT 4:166–67; CSMK 243)

This passage brings to the fore an important way of explicating the unity of the individual person over time. The body is constantly changing from moment to moment, but the soul, being always the one soul of this one body, provides the unifying coherence that is the person throughout life. This would be one way to tie together the mutual independence of

parts of time as the conception applies to the body. But this would then raise the question about the coherence of the soul, and what ties together its modes of thought over time.

The most elaborated claims about the soul-body union and their modes of interaction occur in Descartes's last work, *The Passions of the Soul* (1649). It is noteworthy that the *Passions* is about the soul, and not about the mind, and starts with an epistemic warning, which sets the tone for the whole book. In the First Part, article 1, Descartes castigates the ancients' work on the passions on his way to claiming that he "is obliged to write here as though I were treating a topic that no one before me had ever described" (AT 11:328; V 19). He continues tellingly:

> I take into consideration that whatever is done or happens afresh is generally called by the Philosophers a Passion with respect to the subject it happens to, and an Action with respect to what makes it happen. Thus, even though the agent and the patient are often quite different, Action and Passion are always the same thing, which has these two names, because of the two different subjects it may be referred to (*à raison des deux divers sujets ausquels on la peut raporter*). (AT 11:328; V 19)

The article's caption makes this even clearer: "That what is a passion with respect (*régard*) to a subject is always an action in some other respect (*régard*)" (ibid.).

Earlier, although he suggests that "action" and "passion" are correlative terms, he seems clearly to believe that there is an ontological fact of the matter about motion and other real properties. While still in the grip of real motion, such as we find in the causal realist argument of *Meditation* VI, he writes about the true meaning of action and passion in reply to Regius (1641):

> I have received your theses . . . I find nothing in them which I do not agree with. What you say about actions and passions presents no problem, I think, provided the terms are understood correctly. For in corporeal things, all actions and passions consist simply in local motion; we call it an "action" when the motion is considered in the body that imparts the motion, and a "passion" when it is considered in the body that is moved. It follows from this that when the terms are extended to immaterial things, there is something in such things which has to be considered analogous to motion. So we should use the term "action" for what plays the role of a moving force, like volition in the mind, while we apply the term "passion" to what plays the role of something moved, like intellection or vision in the same mind. Those who think perception should be called an action

> are apparently taking the term "action" to mean any real power, and the term "passion" to mean the negation of a power; for since they think perception is an action, they would no doubt say that the reception of motion in a hard body, or the power whereby it receives the motions of other bodies is an action. Yet it is incorrect to say this, since the "passion" correlative to this action would exist in the body imparting the motion, while the "action" would be in the body that is moved. (To Regius, December 1641; AT 3:454–55; CSMK 199)

This treatment comes three years before the *Principles*, in which (as we saw in detail in chapter 4) motion no longer ought to be considered as truly an action (*actio*). By the time of the *Treatise on the Passions*, not only are action and passion taken to be perspectival (as was motion in the *Principles*), but also the very subject of Descartes's inquiry stresses the teleological nature of the functions of the passions regarding persons. Descartes says his perspective on humans and their passions will be that of the *physicienne* or natural philosopher. In accord with what we have seen concerning sensations and perception in general, the passions are things that happen to persons, even adventitiously, so we need to look for their causes, and then examine their effects in terms of the functions they afford in regard to human beings.

> I observe, moreover, that the objects which move (*meuvent*) the senses do not excite different passions in us because of the differences in the objects, but only because of the various ways in which they may harm or benefit us, or in general have importance for us. The function of all the passions consists solely in this, that they dispose (*disposent*) the soul to want things which nature deems useful for us, and to persist in this volition; and the same agitation of the spirits which normally causes the passions also disposes the body to make movements which help us obtain these things. (II.52; AT 11:372; CSM 1:399)

Souls of human beings must function to allow them as persons to obtain what is needed to gain benefits or avoid harm. In *Passions* II.137, he writes:

> Having given definitions . . . we have only to consider their function (*usage*). Regarding this it must be observed that they are all ordained by Nature (*l'institution de la Nature*) to relate to the body, and to belong to (*sont données a l'âme*) the soul only insofar as it is joined to the body. Hence, their natural function is to move the soul to consent and contribute to the actions which may serve to preserve the body or render it in someway more perfect. For it is only through a feeling of pain (*douleur*) that the soul is immediately advised (*imme-*

> *diatement advertie*) about things that harm the body. . . . Similarly the soul is immediately advised about things useful to the body only through some form of titillation (*chatouillement*), which first excites (*excitant*) joy within it, then gives rise to love of what we believe to be its cause, and finally brings about the desire to acquire something that can enable us to continue this joy, or else to have a similar joy later on. (AT 11:429–30; CSM 1:376)

Both these passages stress the epistemic teleology of the human being that determines the function of the passions. They both stress that in this context we should think only about the soul insofar as it is in union with the body. As we have noted, active and passive with regard to the soul and the body are matters of epistemic perspective. However, the ways in which the person functions are instituted by nature, so that in some sense they have a basis in reality. The function of the mind-body union is to inform humans about what things may harm or help them, and, Descartes says, to ensure that we achieve greater perfections in ourselves.

> It should be noted that, according to the institution of Nature, they [the passions of love, hatred, desire, joy, and sadness] all have natural reference to the body, and are given to the soul only insofar as it is joined [with the body], so that their natural use is to incite the soul to consent and contribute to the actions which can serve to protect the body or render it more perfect in some way. (AT 11:430; V 92)

But he goes on:

> We must consider the passions in so far as they belong to the soul, with respect to which Love and Hatred originate from knowledge and precede Joy and Sadness. . . . And when this knowledge is true—that is, when the things it inclines us to love are truly good and those it incline us to hate are truly bad . . . this Love is extremely good because, joining true goods to us, perfects us to that extent. (AT 11:432; V 940)

So, in this way, perfection comes to the soul too. The mind-body union, especially with regard to the passions, is the means of our perfection—perfection of the body as in health and preservation and perfection of the soul as a developing source of knowledge. Descartes writes to Chanut in 1649: "Health is the greatest of all goods which concern our bodies, but it is the one we least reflect upon and savor. The knowledge of truth is like the health of the soul" (March 31, 1649; AT 5:127; CSMK 370).

The main reason for the mind-body union, given to us by God in the harmonious form of the person, is moral in an epistemic way. The passions, like sensations, and like our knowledge of God, all function to

bring us greater goods, and thereby greater perfection. With regard to the passions we have to think of the soul as passive. We think of the soul as passive and active in regard to sensation, and we think of the soul as active with regard to ideas it forms about God and with regard to its will. But these ways of thinking, given the reciprocity and perspectivalism of the active and passive, lead to problems for drawing a real distinction between mind and body. If active and passive are both truly descriptive at different times and in different contexts of the modes of soul and body, and if these modes are modes of the principal attributes of soul and body, what can such descriptions license about a soul-body distinction? It would seem, by transitivity, that *active*, as applied to body, requires extension to be active in some way and, by parity, *passive*, as applied to soul, requires soul or mind to be passive in some manner. But if the principal attributes of soul and body (thinking and extension) can be both active and passive, and if we know a substance only through its principal attributes, or are able to distinguish soul and body solely by means of their principle attributes, it seems on this basis alone that we will be unable to make and infer a real mind/body distinction. There may be another distinction to be made, which may be drawn intellectually, based on considering mind alone as active and body alone as passive. But from the fact we have to consider their union and their actual and mutual causal connections, it follows that all uses of *mind* (or *soul*) and *body* need not have a real distinction as a basis or metaphysical underpinning that somehow determines their proper use. This need not by itself lead to a denial of any possibility of a real distinction between soul and body, but it does show that we cannot use the real distinction for understanding how the passions work. We need a theory of the passions: for it is theory that tells us how humans attain to such perfection as is possible for them. So we may develop such theories only by taking the epistemic stance.

Epistemic Teleology and Dualism

Given Descartes's epistemic stance, we wish to end this book by briefly considering again in what sense Descartes is a dualist about the mind and the body. We have argued that Descartes's epistemic teleology encompasses his thinking about the role that sensations play in practical knowledge, which regards how we "fit" teleologically into our surrounding environment, and in our efforts to establish scientific knowledge about the world. Sensation also plays the same key role in Descartes's articulation of the mind-body union, since it is only the immediate testimony of our senses (and passions) that provide us with knowledge of the union. It is a primitive notion, which, though it gives us an apprehension of the union,

doesn't satisfy the epistemic criteria that are required for complete concepts of the understanding. This amounts to saying that some things can only be sensed but not understood. Sensations are always confused. In other words, Descartes believes that we are genuine persons, unities composed of two separable but not separated components. Nevertheless, even in that experienced unity, our thinking about ourselves may require two distinct general concepts: modes understood in terms of extension and modes understood in terms of thought. The general concepts of the mind and the body are nonetheless innate, though learned and stored in intellectual memory. They are indispensable *genera*, necessary for thinking about ourselves and the various modal stages we go through as we live our lives as embodied thinking persons. They are also necessary for developing our theories about the world. Thus, the mind-body distinction constitutes an epistemic dualism that anchors our thinking.

As we have seen, Descartes, in his later work, becomes highly perspectivalist. This is evident in his later treatments of motion, of the mind-body distinction, and his use of the terms "action" and "passion," and in many other places. Given that we must think sometimes of the soul as active, and sometimes as passive, and similarly are compelled for the sake of coherent theory to describe the body as active, and then again on other occasions as passive, it is hard to see on what basis a real distinction that is directly grounded in the nature of substance can be established. This point is reinforced again when we realize that what we know directly are particular modes of thought or sensations, and that it is our reflective intellect that we need to employ to access general innate concepts. These general concepts of thought and extension may seem to provide such a basis for an ontological distinction, but some thought has bodily content, and further, the concept of extension seems only to be our best way of conceiving matter when we think about the world. So, in Descartes's late thought, these concepts do not seem to provide a basis for making any sort of direct and principled ontological distinction.

As we saw in our discussion of Descartes's matter theory, he does hold that there is some sort of ontological basis for the way we think (and talk). God could have created the world in the way we think of it, and certainly we know he did create it in some fashion. There is indeed a reality, though we may not understand it in the way in which it is. This is what saves Descartes from being an occasionalist (or worse, an idealist). We saw this too, when we analyzed sensations in the mind to the extent they are grounded in bodily content. There sensations function as *sine quibus non* causes; but more than that, as we argued above, it is the mind's intentional act that grasps the body's content. Yet it is clear that, though there is an epistemic warrant for thinking that what we know about the world is based on how the world is, we do not have adequate

knowledge. We only have knowledge that is complete for us, complete enough to build science and to know ourselves. But we talk of many things in ways we know may be not ultimately correct, as when we attribute force to matter. Our view is epistemically limited:

> True, our mind is not the measure of reality or truth; but certainly it should be the measure of what we affirm or deny. What is more rash or absurd than to want to make judgments about matters which we admit our mind cannot perceive? (Letter to More, February 5, 1649; AT 5:274; CSMK 364)

Perhaps, at the end of his life, Descartes was not much a dualist after all.

REFERENCES

Works by Descartes and Suárez

AT *Oeuvres de Descartes*. Ed. Charles Adam and Paul Tannery. Paris: J. Vrin, 1964–

CSM *The Philosophical Writings of Descartes*. Vols. 1 and 2. Trans. John Cottingham, Robert Stoothof, and Dugald Murdoch. Cambridge: Cambridge University Press, 1985.

CSMK *The Philosphical Writings of Descartes*. Vol. 3. Trans. John Cottingham, Robert Stoothof, Dugald Murdoch, and Anthony Kenny. Cambridge: Cambridge University Press, 1985.

G René Descartes. *The World and Other Writings*. Ed. Stephen Gaukroger. Cambrdige: Cambridge University Press, 1998.

K *Descartes, Philosophical Letters*. Ed. and trans. Anthony Kenny. Oxford: Oxford University Press, 1970.

M René Descartes. *Principles of Philosophy*. Trans. Valentine Rodger Miller and Reese P. Miller. Dordrecht, Holland: D. Reidel, 1983.

O René Descartes, *Discourse on Method, Optics, Geometry, and Meteorology*. Ed. Paul J. Olscamp. Indianapolis: Hackett, 2001.

V René Descartes. *The Passions of the Soul*. Ed. and trans. Stephen H. Voss. Indianapolis: Hackett, 1989.

DM Francesco Suárez. *Disputationes Metaphysicae*. 2 vols. Hildesheim: George Olms, 1965. Reprinted from *Opera Omnia*, ed. C. Berton, vol. 26 (Paris, 1866). This is cited by disputation.section.paragraph, volume:page; thus, DM 17.1.6, 1:582. This is seventeenth disputation, first section, sixth paragraph, in the first volume, p. 582.

Other Works

Adams, Marilyn McCord. 2007. "Powerless Causes: The Case of Sacramental Causality." In *Thinking about Causes: From Greek Philosophy to Modern Physics*, ed. Peter Machamer and Gereon Wolters. Pittsburgh: University of Pittsburgh Press. 47–76.

Adams, R. M. 1975. "Where Do Ideas Come From—Descartes vs. Locke." In *Innate Ideas*, ed. S. Stich. Berkeley and Los Angeles: University of California Press. 71–87.

Alquié, Ferdinand. 1950. *La découverte métaphysique de l'homme chez Descartes*. Paris: Presses Universitaires de France.

Anderson, Wallace. 1976. "Cartesian Motion." In *Motion and Time, Space and Matter: Interrelations in the History of Philosophy and Science*, ed. Peter Machamer and Robert Turnbull. Columbus: Ohio State University Press. 200–223.

Aquinas, Thomas. 1934. *Summa Contra Gentiles*. Rome: Vatican Library.

Aquinas, Thomas. 1964–81. *Summa Theologiae*. Ed. Blackfriars. 61 vols. New York: McGraw-Hill.

Ariew, Roger. 1999. *Descartes and the Late Scholastics*. Ithaca, N.Y.: Cornell University Press.

———. 2005. "Descartes's Fable and Scientific Methodology." *Archives Internationales d'Histoire des Sciences* 55:127–38.

Ariew, Roger, John Cottingham, and Tom Sorrell, eds. 1998. *Descartes' Meditations: Background Source Materials*. Cambridge: Cambridge University Press.

Ariew, Roger, and Donald Cress, eds. and trans. 2006. René Descartes, *Meditations, Objections, and Replies*. Indianapolis: Hackett. xii–xix.

Aristotle. 1957. *Physica*. Ed. W. D. Ross, Oxford: Oxford University Press.

———. 1978. *On Coming-to-Be and Passing-Away*. Trans. E. S. Forster. Loeb Classical Library. Cambridge: Harvard University Press.

———. 1980. *Metaphysica*. Ed. W. Jaeger. Oxford: Oxford University Press.

Armogathe, Jean-Robert. 2000. "Caterus' Objections to God." In *Descartes and His Contemporaries: Meditations, Objections, and Replies*, ed. Roger Ariew and Marjorie Grene. Chicago: University of Chicago Press. 34–43.

Arthur, Richard. 1988. "Continuous Creation, Continuous Time: A Refutation of the Alledged Discontinuity of Time." *Journal of the History of Philosophy* 26:349–75.

———. 2007. "Beeckman, Descartes and the Force of Motion." *Journal of the History of Philosophy* 45:1–28.

Baillet, Adrien. 1691. *La vie de monsieur Des-Cartes*. 2 vols. Paris: Daniel Horthemels; reprint, Geneva: Slatkine, 1970.

Beck, L. J. 1952. *The Method of Descartes: A Study of the Regulae*. Oxford: Oxford University Press.

Beeckman, Isaac. 1939–53. *Journal tenu par Isaac Beeckman de 1604 á 1634*. Ed. Cornelis de Waard. 4 vols. The Hague: M. Nijhoff.

Bennett, Jonathan. 2001. *Learning from Six Philosophers: Descartes, Spinoza, Leibniz, Locke, Berkeley, Hume*. 2 vols. Oxford: Oxford University Press.

Beyssade, Jean-Marie. 1994. "Méditer, Objécter, Répondre." In *Descartes, Objécter et Répondre*, ed. Jean Marie Beyssade and Jean-Luc Marion. Paris: Presses Universitaire de France. 21–38.

Biener, Zvi. 2008. "The Unity of Science in Early Modern Philosophy: Subalternation, Metaphysics, and the Geometrical Manner in Late Scholaasticism, Galileo, and Descartes." Ph.D. diss., University of Pittsburgh.

Carraud, Vincent. 2002. *Causa sive ratio: La raison de la cause, de Suárez à Leibniz*. Paris: Presses Universitaires de France.

Chappell, V. C. 1986. "The Theory of Ideas." In *Essays on Descartes' Meditations*, ed. A. O. Rorty. Berkeley and Los Angeles: University of California Press. 177–88.

Cicero, M. Tullius. 1965. *De Divinatione, De Fato/Timaeus*. Fasc. 46. Bibliotheca Scriptorum Graecorum et Romanorum Teubneriana. Stuttgart: Teubner.

Clarke, Desmond. 1979. "Physics and Metaphysics in Descartes' *Principles*." *Studies in History and Philosophy of Science* 10, no. 2: 89–112.

———. "The Concept of *Vis* in Part III of the *Principia*." In *Descartes's Principia Philosophiae (1644–1994)*. Naples: Vivarium. 321–39.

Clarke, Desmond. 1996. 2003. *Descartes' Philosophy of Mind*. Oxford: Oxford University Press.

Clatterbaugh, Kenneth. 1980. "Descartes's Causal Likeness Principle." *Philosophical Review* 89:379–402.

———. 1995. "Cartesian Causality, Explanation and Divine Concurrence." *History of Philosophy Quarterly* 12:195–89.

———. 1999. *The Causation Debate in Modern Philosophy*. New York: Routledge.

Clement of Alexandria. 1992. *Clemens Alexandrinus: Stromata*. In *Patrologiae cursus completus: Series graeca*, ed. J.-P. Migne. Vols. 8–9. Paris: Migne.

Conimbricenses. 1598. *Commentarii in octo libris physicorum Aristotelis*. Reprint, Hildesheim: Olms, 1986.

Cottingham, John, ed. and trans. 1976. *Descartes' Conversation with Burman*. Oxford: Oxford University Press.

Davenport, Anne Ashley. 2006. *Descartes' Theory of Action*. Leiden: Brill.

Della Rocca, Michael. 1999. " 'If a Body Meet a Body': Descartes on Body-Body Causation." In *New Essays on the Rationalists*, ed. Rocco J. Gennaro and Charles Huenemann. Oxford: Oxford University Press. 48–81.

Des Chene, Dennis. 1996. *Physiologia: Natural Philosophy in Late Aristotelian and Cartesian Thought*. Ithaca, N.Y.: Cornell University Press.

———. 2000. "On Laws and Ends: A Response to Hattab and Menn." *Perspectives on Science* 8:144–63.

Doyle, John P. 1967. "Suárez on the Reality of the Possible." *Modern Schoolman* 44:29–48.

Dunphy, William. 1966. "Peter of Auvergne and the Twofold Efficient Cause." In *Mediaeval Studies*, vol. 27. Toronto: Pontifical Institute of Mediaeval Studies. 1–21.

Eutaschius a Santo Paulo. 1609. *Summa philosophiae quadripartitade rebus dislecticis, moralibus, physics, et metaphysics*. Paris.

Fonseca, Petrus. 1577–98. *Commentaria in Aristotelis stagiritae metaphysicorum libros*. Reprint, Hildesheim: Olms, 1964.

Franco, Abel. 2006. "Descartes' Theory of the Passions." Ph.D. diss., University of Pittsburgh.

Frankfort, Harry. 1999. "Continuous Creation, Ontological Inertia, and the Discontinuity of Time." In *Necessity, Volition, and Love*. Cambridge: Cambridge University Press. 67–68.

Freddoso, Alfred J., trans. 1994. Francisco Suárez, *On Efficient Causality: Metaphysical Disputations 17, 18, and 19*. New Haven: Yale University Press.

———, trans. 2002. Francisco Suárez, *On Creation, Conservation, and Concurrence: Metaphysical Disputations 20, 21, and 22*. South Bend, Ind.: St. Augustine's Press.

Frede, Michael. 1987. *Essays in Ancient Philosophy*. Minneapolis: University of Minnesota Press.

Gabbey Alan. 1980. "Force and Inertia in the Seventeenth Century: Descartes and Newton." In *Descartes: Philosophy, Mathematics and Physics*, ed. Stephen Gaukroger. Sussex: Harvester Press; Totowa, N.J.: Barnes and Noble. 230–320.

Galileo. 1970. *Dialogo sopra i due massimi sistemi del mondo, tolemaico e copernicano* (*Dialogue on the Two Chief World Systems*) (1632). Ed. Libero Sosio. Turin: Eiunaudi.

Garber, Daniel. 1978. "Science and Certainty in Descartes." In *Descartes*: *Critical and Interpretative Essays*, ed. Michael Hooker. Baltimore: Johns Hopkins University Press. 114–51.

———. 1992. *Descartes' Metaphysical Physics*. Chicago: University of Chicago Press.

———. 2001. "Descartes on Knowledge and Certainty." In *Descartes Embodied: Reading Cartesian Philosophy through Cartesian Science*. Cambridge: Cambridge University Press. 111–29.

Garber, Daniel, and Cohen, Lesley. 2001. "A Point of Order: Analysis, Synthesis, and Descartes' *Principles*." In Daniel Garber, *Descartes Embodied: Reading Cartesian Philosophy through Cartesian Science*. Cambridge: Cambridge University Press. 52–63.

Gaukroger, Stephen, ed. 1980. *Descartes: Philosophy, Mathematics, and Physics*. Sussex: Harvester; Totowa, N.J.: Barnes and Noble.

———. 1995. *Descartes: An Intellectual Biography.* New York: Oxford University Press.

———. 2002. *Descartes' System of Natural Philosophy.* Cambridge: Cambridge University Press.

Gilson, Étienne. 1913. *Index scolastico-cartésien*. Paris: Felix Alcan.

———. 1951. *Études sur Le Role de la Pensée Médiévale dans La Formation du Système Cartésien* (1921). Études de philosophie médiévale, vol. 13. Paris: Libraire Philosophique J. Vrin.

———. 1986. "Notes pour l'Histoire de la Cause Éfficiénte." In *Études Médiévales*. Paris: Libraire Philosophique J. Vrin.

Goclenius, Rudolphus. 1613. *Lexicon philosophorum*. Reprint, Hildesheim: Olms, 1964.

Gonthier, Thierry. 2005. *Descartes et la causa sui*: *Autoproduction divine, autodetemination humaine*. Paris: Vrin.

Gorham, Geoffrey. 2003. "Descartes's Dilemma of Eminent Containment." *Dialogue* 42:3–25.

———. 2004. "Cartesian Causation: Continuous, Instantaneous, Overdetermined." *Journal of the History of Philosophy* 42:389–423.

Grayling, A. C. 2005. *Descartes: The Life of René Descartes and Its Place in His Times*. London: Free Press.

Guéroult, M. 1968. *Descartes selon l'ordre des raisons*. 2 vols. Paris: Aubier-Montaigne.

———. 1980. "The Metaphysics and Physics of Force in Descartes." In *Descartes: Philosophy, Mathematics and Physics*, ed. Stephen Gaukroger. Sussex: Harvester Press; Totowa, N.J.: Barnes and Noble. 196–229.

Hatfield, Gary. 1979. "Force (God) in Descartes's Physics." *Studies in History and Philosophy of Science* 10:113–40.

———. 1985 "First Philosophy and Natural Philosophy in Descartes." In *Philosophy, Its History and Historiography*, ed. A. J. Holland. Dordrecht: D. Reidel. 149–64.

Hatfield, Gary. 1986. "The Senses and the Fleshless Eye: The *Meditations* as Cognitive Exercises." In *Essays on Descartes' Meditations*, ed. Amelie O. Rorty. Berkeley and Los Angeles: University of California Press. 45–79.

———. 2003. *Descartes and the Meditations*. New York: Routledge.

Hatfield, Gary, and W. Epstein. 1979. "The Sensory Core and the Medieval Foundations of Early Modern Perceptual Theory." *Isis* 70:363–84.

Hattab, Helen. 1998. "The Origins of a Modern View of Causation: Descartes and His Predecessors on Efficient Causes." Ph.D. diss., University of Pennsylvania.

———. 2001. "The Problem of Secondary Causation in Descartes: A Response to Des Chene." *Perspectives on Science* 8:93–116.

———. 2007. "Concurrence or Divergence? Reconciling Descartes's Science with His Metaphysics." *Journal of the History of Philosophy* 45:49–78.

Hausman, David, and Alan Hausman. 1987. *Descartes's Legacy: Minds and Meaning in Early Modern Philosophy.* Toronto: University of Toronto Press.

Heffernan, George, ed. and trans. 1996. René Descartes, *Regulae ad Directionem Ingenii*. Bad Godesberg: Schlaraffenland Verlag.

Ishiguro, Hide. 1986. "The Status of Necessity and Impossibility in Descartes." In *Essays on Descartes' Meditations*, ed. Amelie O. Rorty. Berkeley and Los Angeles: University of California Press. 459–71.

Jolly, Nicholas. 1987. "Descartes and the Action of Body on Mind." *Studia Leibnitiana* 19:41–53.

———. 1990. *The Light of the Mind*. Oxford: Oxford University Press.

Katz, Jerrold J. 1987. "Descartes' Cogito." *Pacific Philosophical Quarterly* 68:175–96.

Keeling, S. V. 1968. *Descartes*. 2nd ed. New York: Oxford University Press.

Kemp-Smith, Norman. 1952. *New Studies in the Philosophy of Descartes*. London: Macmillan.

Lennon, Thomas. 1994. "The Problem of Individuation among the Cartesians." In *Individuation and Identity in Early Modern Philosophy: Descartes to Kant*, ed. Kenneth F. Barber and Jorge J. E. Gracia. Albany: State University of New York Press. 19–24.

———. 1995. "Pandora, or, Essence and Reference: Gassendi's Nominalist Objection and Descartes' Realist Reply." In *Descartes and His Contemporaries: Meditations, Objections, and Replies*, ed. Roger Ariew and Marjorie Grene. Chicago: University of Chicago Press. 159–81.

———. 1998. "The Cartesian Dialectic of Creation." In *Cambridge History of Seventeenth Century Philosophy*, ed. Daniel Garber and Michael Ayers. Cambridge: Cambridge University Press. 331–62.

———. 2007. "The Eleatic Descartes." *Journal of the History of Philosophy* 45:29–47.

Locke, John. 1690; 1959. *Essay Concerning Human Understanding*. Ed. Alexander Campbell Fraser. 2 vols. New York: Dover.

Love, Rosaleen. 1975. "Revisions of Descartes's Matter Theory in *Le Monde*." *British Journal for the History of Science* 8:127–37.

Machamer, Peter. 1976. "Causality and Explanation in Descartes' Natural Philosophy." In *Motion and Time, Space and Matter: Interrelations in the History of*

Philosophy and Science, ed. Peter Machamer and Robert G. Turnbull. Columbus: Ohio State University Press. 168–99.

Machamer, Peter. 1998. "Galileo's Machines, His Mathematics and His Experiments." In *The Cambridge Companion to Galileo*, ed. Peter Machamer. Cambridge University Press. 53–79.

———. 2000. "Individualism and the Idea(l) of Method." In *Scientific Controversies: Philosophical and Historical Perspectives*, ed. Peter Machamer, Marcello Pera, and Aristides Baltas. New York: Oxford University Press. 81–99.

Marion, Jean-Luc. 1981. *Sur la théologie blanche de Descartes*. Paris: Presses Universitaires de France.

———. 1986a. "The Essential Incoherence of Descartes' Definition of Divinity." In *Essays on Descartes' Meditations*, ed. Amelie O. Rorty. Berkeley and Los Angeles: University of California Press. 297–338.

———. 1986b. *On Descartes' Metaphysical Prism: The Constitution and the Limit of Onto-Theology in Cartesian Thought*. Trans. Jeffery Kosky. Chicago: University of Chicago Press.

———. 1994. "Entre analogie et principe de raison: La cause sui." In *Descartes: Objécter et Répondre*, ed. Jean-Marie Beyssade and Jean-luc Marion. Paris: Presses Universitaires de France. 305–34.

——— 1995. *Sur l'ontologie grise de Descartes*. Paris: Vrin.

Markie, Peter J. 1982–83. "The *Cogito* Puzzle." *Philosophy and Phenomenological Research* 43:59–81.

McGuire, J. E. 1994. "Natural Motion and Its Causes: Newton on the 'Vis Insita' of Bodies." In *Self-Motion: From Newton to Aristotle*, ed. Mary Louise Gill and James G. Lennox. Princeton: Princeton University Press. 305–29.

———. 2007. "A Dialogue with Descartes: Newton's Ontology of True and Immutable Natures." *Journal of the History of Philosophy* 45:103–27.

McLaughlin, Peter. 1993. "Descartes on Mind-Body Interaction and the Conservation of Motion." *Philosophical Review* 102:155–81.

McRae, R. 1972a. "Descartes' Definition of Thought." In *Cartesian Studies*, ed. R. J. Butler. Oxford: Oxford University Press. 55–70.

———. 1972b. "Innate Ideas." In *Cartesian Studies*, ed. R. J. Butler. Oxford: Oxford University Press. 32–54.

Mehl, Edouard. 2001. *Descartes en Allemagne, 1619–1620: Le contexte allemand de l'élaboration de la science cartésienne*. Strasbourg: Presses Universitaires de Strasbourg.

Menn, Stephen. 1997. "Descartes, Augustine, and the Status of Faith." In *Studies in Seventeenth-Century European Philosophy,* ed. M. A. Stewart. Oxford: Clarendon Press; New York: Oxford University Press. 1–31.

———. 1998. *Descartes and Augustine*. Cambridge: Cambridge University Press.

———. 2000. "On Dennis Des Chene's *Physiologia*." *Perspectives on Science* 8:319–42.

Miller, David. 2006. "Representations of Space in Seventeenth Century Physics." Ph.D. diss., University of Pittsburgh.

Morin, J. 1998. "*Quod Deus sit*" (1635). In *Descartes' Meditations: Background Source Materials*, ed. Roger Ariew, John Cottingham, and Tom Sorell. Cambridge: Cambridge University Press. 231–51.

Nadler, Steven M. 1990. "Deduction, Confirmation, and the Laws of Nature in Descartes's *Principia philosophiae*." *Journal of the History of Philosophy* 28:359–83.

Normore, Calvin. 1986. "Meaning and Objective Being: Descartes and His Sources." In *Essays on Descartes' Meditations*, ed. Amelie O. Rorty. Berkeley and Los Angeles: University of California Press. 223–41.

Olivo, Gilles. 1997a. "La sagesse des principes: La *mathesis universalis* dans les *Principiae philosophiae* de Descartes." In *Lire Descartes aujourd'hui*, ed. Depré Olivier and Lories Danielle. Louvain: Éditions Peters. 69–84.

———. 1997b. "L'efficience en cause: Suárez, Descartes et la question de la causalité." In *Études de philosophie médiévale*, vol. 75. Paris: J.Vrin. 91–105.

O'Neill, Eileen. 1987. "Mind-Body Interaction and Metaphysical Consistency: A Defense of Descartes." *Journal of the History of Philosophy* 25:337–54.

———. 1993. "Influxus Physicus." In *Causation in Early Modern Philosophy*, ed. Steven Nadler. State College: Pennsylvania State University Press. 27–55.

Osler, M. J. 1994. *Divine Will and the Mechanical Philosophy: Gassendi and Descartes on Contingency and Necessity in the Created Order*. Cambridge: Cambridge University Press.

Palmer, Eric. 1999. "Descartes on Nothing in Particular." In *New Essays on the Rationalists*, ed. Rocco J. Gennaro and Charles Huenemann. New York: Oxford University Press. 26–47.

Pessin, Andrew. 2004. "Descartes's Nomic Concurrentism: Finite Causation and Divine Concurrence." *Journal of the History of Philosophy* 41:25–49.

Philoponus, John. 1993. *On Aristotle's Physics 2*. Trans. A. R. Lacey. Ithaca, N.Y.: Cornell University Press.

Pitte, Frederick van de. 1985. "Descartes' Innate Ideas." *Kant-Studien* 76: 363–84.

Rodis-Lewis, Genevieve. 1992. "Descartes' Life and the Development of His Philosophy." In *The Cambridge Companion to Descartes*, ed. John Cottingham. Cambridge: Cambridge University Press. 22–57.

Rozemond, Marleen. 1998. *Descartes's Dualism*. Cambridge: Harvard University Press.

Schmitt, Charles B. 1983. *Aristotle and the Renaissance*. Cambridge: Harvard University Press.

———, gen. ed. 1988. *The Cambridge History of Renaissance Philosophy*. Cambridge: Cambridge University Press.

Schmaltz, Tad. 1997. "Descartes on Innate Ideas, Sensations and Scholasticism: The Response to Regius." In *Studies in Seventeenth-Century European Philosophy*, ed. M. A. Stewart. Oxford: Clarendon Press; New York: Oxford University Press. 33–73.

———. 2002. "The Cartesian Refutation of Idealism." *British Journal for the History of Philosophy* 10:513–40.

———. 2008. *Descartes on Causation*. Oxford: Oxford University Press.

Secada, J.E.K. 1990. "Descartes on Time and Causality." *Philosophical Review* 99:45–72.

Shapiro, Alan E. 1973. "Kinematic Optics: A Study of the Wave Theory of Light in the Seventeenth Century." *Archive for the History of the Exact Sciences* 11:134–266.

Shuster, John. 1977. "Descartes and the Scientific Revolution, 1618–1634." Ph.D. diss., Princeton University.

Silhon, Jean de. 1991. *Les deux verités* (1626). Paris: Fayard University Press.

———. 1998. *The Two Truths*. In *Descartes' Meditations: Background Source Materials*, ed. Roger Ariew, John Cottingham, and Tom Sorell. Cambridge: Cambridge University Press. 177–98.

Simmons, Alison. 1999. "Are Cartesian Sensations Representational?" *Nous* 33:347–69.

———. 2001. "Sensible Ends: Latent Teleology in Descartes' Account of Sensation." *Journal of the History of Philosophy* 39:49–75.

———. 2003. "Descartes on the Cognitive Structure of Sensory Experience." *Philosophy and Phenomenological Research* 67:549–79.

Simplicius. 1997. *On Aristotle's Physics 2*. Trans. Barrie Fleet. Ithaca, N.Y.: Cornell University Press.

Slowik, Edward. 1999. "Descartes, Space-Time, and Relational Motion." *Philosophy of Science* 66:117–39.

———. 2001. "Descartes and Individual Corporeal Substance." *British Journal for History of Philosophy* 9:1–15.

Spinoza, Benedict de. 1966. *Ethics*. Ed. James Gutmann. New York: Hafner.

Van Berkel, Klass. 1983. "Beeckman, Descartes, et la philosophie physico-mathématique." *Archives de Philosophie* 46:620–26.

Verbeek, Theo. 1995. "The First Objections." In *Descartes and His Contemporaries: Meditations, Objections, and Replies*, ed. Roger Ariew and Marjorie Grene. Chicago: University of Chicago Press. 21–33.

Watson, Richard. 2003. *Cogito, Ergo Sum*. Boston: David R. Godine.

Wells, Norman J. 1981. "Suárez on the Eternal Truths, I and II." *Modern Schoolman* 58:73–104, 159–74.

———. 1990. "Objective Being in Descartes, Suárez and Caterus." *Journal of the History of Philosophy* 28:33–61.

———. 1993. "Descartes' Idea and Its Sources." *American Catholic Philosophical Quarterly* 67:513–35.

Wilson, Margaret D. 1978. *Descartes*. London: Routledge.

———. 1999a. "Descartes on the Perception of Primary Qualities." In *Ideas and Mechanism: Essays on Early Modern Philosophy*. Princeton: Princeton University Press. 26–40.

———. 1999b. "Descartes on the Origin of Sensation." In *Ideas and Mechanism: Essays on Early Modern Philosophy*. Princeton: Princeton University Press. 41–68.

———. 1999c. "Descartes on the Representationality of Sensation." In *Ideas and Mechanism: Essays on Early Modern Philosophy*. Princeton: Princeton University Press. 69–83.

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