# INTRODUCTION

My interest in Descartes was originally piqued when, as a graduate student, I had to assist in an introduction to philosophy. The Descartes I was asked to teach the students didn't make much sense to me; I couldn't figure out his point of view, why he was asking the kinds of questions he was asking, and why he was giving the kinds of answers he was giving. Something about his larger intellectual context seemed to be missing. But even then I knew that Descartes was deeply involved in the physical sciences of his day, and even without knowing exactly what Cartesian science meant, I had a deep suspicion that it was somehow connected with the philosophical writings I was teaching my undergraduates, the *Meditations* and the *Discourse on the Method*. At the time I was also very interested in the latest currents in contemporary philosophy, particularly the philosophy of Quine. Quine's enormously influential "Epistemology Naturalized" had just appeared, and everyone was talking about a more general naturalization of philosophy and the intimate connection between philosophy and the sciences.[1] That gave me all the more reason to turn to Descartes and his contemporaries, who, in a sense, took it for granted that there was a continuum between what we call philosophy and what we consider the sciences.

And so I undertook a serious study of Descartes' science, as well as that of his contemporaries. This led me to a number of interesting observations. I came to see that Descartes' thought must be understood in the context of the attempt to reject Aristotelian physics, and replace

1 See W. V. O. Quine, *Ontological Relativity and Other Essays*. New York: Columbia University Press, 1969, pp. 69–90.

it with a different kind of physics, one grounded in a mechanistic conception of nature. For an Aristotelian physicist, natural philosophy is ultimately grounded in the irreducible tendencies bodies have to behave one way or another, as embodied in their substantial forms. Some bodies naturally fall, and others naturally rise; some are naturally cold, and others are naturally hot; some are naturally dry, and others are naturally wet. For the mechanist, though, the world is a machine, all the way down. According to the mechanical philosophy, of which Descartes was a founder, I would argue, everything in the physical world must be explained in the way in which we explain machines, through the size, shape, and motion of their parts. Descartes was not the only thinker of the period to hold such a view. Though there are some interesting and important differences among them, differences that Descartes himself emphasized in many cases, one must also include here contemporary figures such as Galileo, Mersenne, Gassendi, Hobbes, Roberval, and Beeckman, later Boyle, Locke, and many others. Nor was the mechanical philosophy the only alternative to Aristotelianism; there were also alchemical, astrological, hermetic, Platonic, and other alternatives in the mix. One must understand Descartes' philosophy as a part of this larger program to replace the Aristotelian philosophy with a new and better alternative.

But there is a particular way in which Descartes approached the task of replacing the Aristotelian philosophy with a mechanical philosophy. Although Descartes was interested in what we would call mathematical and scientific questions, it was important for him to ground his view of the make-up of bodies and the laws that they observe in what he called a metaphysics. In a celebrated passage from the preface to the French edition of the *Principia*, Descartes writes that "all philosophy is like a tree, whose roots are metaphysics, whose trunk is physics, and whose branches, which grow from this trunk, are all of the other sciences, namely medicine, mechanics, and morals."[2] In the philosophical literature, particularly that written by Anglo-American historians of philosophy, almost all the attention has been to the metaphysical roots. I thought that it would be very useful to turn my attention to the part of the tree above ground, the trunk and the branches which were, if anything, more visible to Descartes' contemporaries than the metaphysical roots.

2 AT IXB 14. See the note on abbreviations and translations for the conventions used in citing Descartes' writings.

One of the fruits of this work was my book, *Descartes' Metaphysical Physics*.[3] In this book, I tried to give a critical exposition of Descartes' physical thought, and discuss the arguments and positions that Descartes offered in his writings on physics, mainly *Le Monde* (1633) and the *Principia Philosophiae* (1644), paying special attention to the way in which they are grounded in metaphysics. But, at the same time, I was also working on some of the more traditional questions in Descartes' thought, questions about knowledge, method, mind, and matter, exploring the way in which understanding Descartes' scientific thought might illuminate those more familiar aspects of Descartes' philosophy. Many of the essays in this collection are part of this effort. In taking the approach I do in these essays, I do not mean to argue that it is the *only* approach that one can take, that the *only* way one can understand Descartes is through his scientific writings. Descartes was a multifaceted character, and there are a number of approaches that one can take to illuminate his thought. All I mean to assert is that this is one of them.

I should also say something about the historiographical ideas that lie behind these essays. The last twenty or thirty years have seen enormous changes in the way in which the history of philosophy is written, at least in English. When I first began working in the field in the mid-1970s, the dominant trend in Cartesian studies was to give careful attention to Descartes' arguments and positions, and scrutinize them in accordance with the current philosophical standards and doctrines. What it also meant, often enough, was a Cartesian philosophy pulled out of its intellectual context, with any historical considerations explicitly marginalized. I can remember in the late 1960s one of my undergraduate teachers wondering, in all seriousness, whether Descartes wrote *before* or *after* Newton! Furthermore, the texts were almost always studied in translation, with no need to know either the original language texts or any of the literature outside of English. Things have changed considerably since then; the history of philosophy, at least in the early-modern period, is more and more genuinely historical. It is getting less and less possible to do history of philosophy in translation alone, with no attention to historical context, and I am proud to have had some small part in this change of standards. This historiographical theme is also reflected in the essays collected here. For me, understanding Descartes historically means first and foremost situating him in the context of the larger

3 Chicago: University of Chicago Press, 1992. It has recently appeared in French as *La physique métaphysique de Descartes*, Paris: Presses Universitaires de France, 1999.

intellectual trends. However, it should also involve the attempt to understand Descartes as a living, breathing human being, who learns (and forgets) things, whose views develop and change over time, even if he himself is not always aware of that dimension of his thought.

My historical temperament should not be taken to mean that I am uninterested in philosophy, and that I am abandoning a genuinely philosophical history of philosophy for a contextual history of ideas or an intellectual biography. Like many philosophical historians of philosophy, I believe in engaging historical figures, such as Descartes, in critical discourse, and even in rationally reconstructing their positions. However, as a historian of philosophy, I want as much as possible to do so on their own terms. Insofar as my job is to illuminate the thought of a Descartes or a Leibniz or a Locke, I would prefer to do so by using terms and doctrines that they would find intelligible, to debate with them in their own language. Again, I acknowledge that this is not the only valid way of approaching the subject: It *is* important for us now to understand why a Cartesian account of the physical world is no longer acceptable, and to do this involves engaging Descartes in a discussion with modern philosophy of science and even modern physics. But unless we understand Descartes' projects on their own terms, in the terms in which they were conceived, we cannot really understand what exactly his views *really* were, how they *really* relate to current conceptions, and what their true philosophical significance is.

It is for reasons like this that I want to downplay (or perhaps even blur) the distinction between history of philosophy and history of ideas. As Bernard Williams characterizes the distinction in his classic book, *Descartes*: *The Project of Pure Enquiry*,[4] "history of ideas is history before it is philosophy, while with the history of philosophy it is the other way round." When dealing with an historical text, the history of ideas, according to Williams, focuses on the question "what *did* it mean" for its contemporaries, whereas the history of philosophy focuses on the question of its philosophical content. Williams writes: "The history of philosophy of course has to constitute its object, the work, in genuinely historical terms, yet there is a cut-off point, where authenticity is replaced as the objective by the aim of articulating philosophical ideas." Williams casts his lot with history of philosophy understood in this way, and offers a self-consciously twentieth-century reconstruction of

4 New York: Penguin Books, 1978. All the quotations are taken from pp. 9–10.

Descartes' thought. But can we really make the kind of separation that Williams (and many, many others) postulate? I can certainly understand those who want to ignore history, and attack philosophical questions directly; this, in a way, is the Cartesian spirit. However, *if* one chooses to write about Descartes (or Spinoza, or Locke, or . . .), then, it seems, this entails a kind of commitment to understand what they are trying to say; a history of philosophy based on myths and partially understood texts is neither good history nor good philosophy, substituting for Descartes' authentic thought a pale reflection of the contemporary views of interest to us. If we are to learn philosophy from Descartes, as opposed to using him as a mere foil for our contemporary views, then we must try to reach genuine understanding of what he thinks. And genuinely understanding an historical figure requires significant historical work, often going beyond the texts themselves and into the contemporary culture to understand their presuppositions. Similarly, one cannot approach good history of ideas (in Williams' sense) without understanding the philosophy as philosophy, as arguments and distinctions and attempts at addressing systematically what are taken to be important problems. I don't think that one should have to choose between the one and the other, between philosophical interest and historical sophistication. One needs both. Period.

Though the essays in this collection are all attempts at recovering a genuinely historical Descartes, in reading them over again, I am struck by how far scholarship has come in the last years. When I originally wrote them, and when they were originally published, many of these essays were then on the outer edge of what was acceptable in the history of philosophy; it is only through the kindness of editors who invited me to contribute to collections or special issues of journals that many of them found their way into print. But looking back at them now, they seem, in a sense, rather old-fashioned. The essays are based on a careful reading of the texts, all the texts, and not just the few generally read in philosophy classes. Also, I try very hard to put those texts in the context of other texts then in circulation, particularly late scholastic texts. However, two main things are missing. Although there is a smattering of names unfamiliar to historians of philosophy, there are not enough of them. In part this defect is addressed in the *Cambridge History of Seventeenth-Century Philosophy*,[5] which I co-edited with Michael Ayers. There we made sure that less familiar names such as Sir Kenelm Digby,

5 Cambridge: Cambridge University Press, 1998.

Henry More, Louis de La Forge, and many others were reintegrated in the story. But what is missing even there is the social context. Ideas exist in people, and people exist in societies. As a consequence, social factors can sometimes play a nonnegligible role in philosophy. Although this is a commonplace now in the history of science (indeed, probably overdone), it is, I suspect, still a heresy in the history of philosophy. While I was doing my best to be heretical in some of the essays published in this volume, the social historical approach was a kind of heresy that I hadn't yet come to appreciate. It will be better represented in some work currently in progress, a general study of the rise of the "new philosophy" in Paris in the 1620s and beyond.

It may be helpful to the reader to provide a brief guide to the contents of the book, and point out some themes and connections that might not be evident at first reading.

Part I of the book ("Historiographical Preliminaries") is a general historiographical essay, (1) "Does History Have a Future?" In this essay, I treat the general question of how one ought to do the history of philosophy, and why one ought to do it. I argue, most centrally against Jonathan Bennett, but also against many who share his conception of the history of philosophy, that the history of philosophy should be done in a historically responsible way, and that the only way to recover the true philosophical significance of historical figures is to understand them in their proper historical context. I further try to show what the history of philosophy done in this way can contribute to the enterprise of philosophy, how it can be used to challenge assumptions that we take for granted by exhibiting philosophical programs with perspectives very different from ours. This essay serves to present the methodology that I follow in the remainder of the essays in the collection.

Part II of the collection ("Method, Order and Certainty") is concerned with methodological and epistemological issues in Descartes' philosophy. In (2) "Descartes and Method in 1637," I treat the method as articulated in Descartes' *Rules for the Direction of the Mind* (1620–1628 (?)) and the *Discourse on the Method* (1637). It is generally assumed that the method that Descartes articulates in those earlier works follows him throughout his career. In opposition to that, I argue that in an important sense, the official method is abandoned in Descartes' later writings, both scientific and philosophical. In the following two essays, (3) "A Point of Order: Analysis, Synthesis, and Descartes's *Principles*"

(written jointly with Lesley Cohen) and (4) "J. B. Morin and the *Second Objections*," I treat the question of geometrical method in Descartes' writings. There is a standard reading of Descartes in accordance with which the *Meditations* (1637) are written in the analytic style, supposedly following the method of discovery of the *Rules* and the *Discourse*, whereas the more scientifically oriented *Principles of Philosophy* (1644) was written in the synthetic style characteristic of Euclidean geometry. This distinction has shaped a number of readings of Descartes' philosophy, including most visibly the influential reading of Martial Gueroult.[6] In "A Point of Order" I argue against this dogma of Cartesian scholarship and suggest how to understand the different styles of these two central works in Descartes' corpus. In "J. B. Morin and the *Second Objections*" I extend the argument by showing that one of the texts that supposedly grounds this interpretation, the end of the *Second Replies* to the *Meditations*, was originally written not to endorse the synthetic method in any way, but as a reaction against another philosopher (and well-known Aristotelian, anti-Copernican, and astrologer of his day), Jean-Baptiste Morin, who wrote a short tract on the existence of God in the style of a Euclidean geometry text, a tract from which Descartes clearly wanted to dissociate himself. The last two essays in this part concern Descartes' actual method of conducting experimental inquiries in his earlier and later works. In (5) "Descartes and Experiment in the *Discourse* and *Essays*" I show how, Descartes' method from the *Rules* and the *Discourse* was used in the practice of experimental science by examining his analysis of the rainbow as given in the *Meteors*, published with the *Discourse* in 1637. In that essay, I try to show how, for Descartes in this period, experiment is fully consistent with certainty. In (6) "Descartes on Knowledge and Certainty," I show how the problems of experimental philosophy ultimately move Descartes to abandon the claim that he can have certain knowledge of the microstructure of matter, something that I think he had earlier believed he could have.

Part III of the collection ("Mind, Body, and the Laws of Nature") is concerned with a number of central metaphysical and scientific questions in Descartes' philosophy. In (7) "Mind, Body, and the Laws of

6 See Martial Gueroult, *Descartes' Philosophy Interpreted According to the Order of Reasons*, trans. Roger Ariew. (2 vols.) Minneapolis: University of Minnesota Press, 1984; and *Nouvelles réflexions sur la preuve ontologique*. Paris: Vrin, 1955.

Nature in Descartes and Leibniz," I discuss the relation between voluntary activity and the laws of nature. It has been a standard view of Descartes that he had wanted to make all the physical behavior of the human being consistent with his law of the conservation of quantity of motion. On that reading, Descartes is supposed to have held that the human will can change the direction of the motion of a body, but not its speed. Since Descartes' conservation law governs only speed and not direction, it was thought that this account allowed Descartes to render human voluntary activity consistent with his conservation law. However, Leibniz showed that Descartes' conservation law is incorrect, and that the correct conservation laws constrain direction as much as they do speed. And so, Leibniz argued, that ploy won't work. By carefully examining Descartes' conception of the laws of nature and how they derive from God, I argue that Descartes never intended human beings to be governed by his laws of nature. I also show how Leibniz's metaphysics differs profoundly from Descartes' in this regard, and why for him, the human being cannot stand outside of nature, as it can for Descartes. The following essay, (8) "Understanding Interaction: What Descartes Should Have Told Elisabeth," also concerns mind and body in Descartes. It argues that Descartes' famous letters to Elisabeth in 1643, explaining mind-body and body-body interaction, are importantly misleading. In those letters, Descartes claims that mind-body interaction and body-body interaction are each understood through their own separate primitive notions. This, I claim, is inconsistent with some of Descartes' most basic commitments elsewhere. Rather, I argue, body-body interaction, the interaction between inanimate physical objects, must be understood ultimately through God, whose activity determines the laws of motion. The activity of God, in turn, must be understood through our own experience of how we act on our own bodies. In this way, mind-body interaction is the ultimate model in terms of which we understand all physical interaction for Descartes. The analysis of the physical interaction among bodies is continued in the next piece, (9) "How God Causes Motion: Descartes, Divine Sustenance, and Occasionalism," where I discuss how the dependence of the laws of nature on God gives rise to accusations of occasionalism in Descartes, and explicit arguments for occasionalism in some of his followers. I argue that the way in which Descartes conceives of divine activity leads him to reject a full occasionalism, where God is the only genuine causal agent. However, differences in the way some of his followers conceive of divine activity lead them in another direction, to the occasionalism

characteristic of the later Cartesian tradition. In the following essay, (10) "Descartes and Occasionalism," the question of Descartes' occasionalism is examined in a more general way, where it is argued that contrary to much of the critical literature, Descartes was not a genuine occasionalist. The last two essays in this section, (11) "*Semel in vita*: The Scientific Background to Descartes' *Meditations*" and (12) "Forms and Qualities in the *Sixth Replies*" both deal more directly with the relation between Descartes' metaphysics and his physics. "*Semel in vita*" gives a general overview of the way in which Descartes' metaphysics and epistemology undermine Aristotelian science and ground the new physics that he is presenting in his works. "Forms and Qualities" discusses more specifically the issue of Descartes' rejection of Aristotelian forms and qualities, particularly as it is treated in a crucial passage at the end of the *Sixth Replies*.

In Part IV of the collection ("Larger Visions"), I include two essays that give larger views of Descartes' philosophy. In (13) "Descartes, or the Cultivation of the Intellect," I present a view of Descartes' conception of the educated person, and how his conception of the human being and the natural world led to a revolutionary conception of education, rejecting the authority of the book and the teacher for the authority of the intellect. Finally, in (14) "Experiment, Community, and the Constitution of Nature in the Seventeenth Century," I put Descartes' epistemology in the context of larger movements in seventeenth-century thought, and show how Descartes' radically individualistic epistemology eventually gave way to a more social conception of knowledge and scientific inquiry, as institutions such as the Royal Society of London and the Académie des Sciences in Paris entered the scene, and redefined the scientific world.

The careful reader may have noticed an oddity in the subtitle of this collection, "Reading Cartesian Philosophy through Cartesian Science." Strictly speaking, this title makes little sense for the seventeenth century. At that time, neither philosophy nor science as we now know them could properly be said to exist as distinct domains of knowledge: What we call philosophy and what we call science were part of a single domain of inquiry, which went under the rubric of philosophy. But within Descartes' thought there certainly was a distinction between the foundational disciplines of philosophy, what he called "first philosophy" or sometimes "metaphysics," and natural philosophy, between the roots of his tree of philosophy and the trunk. It is this distinction that I have

in mind when I am talking about reading the philosophy through the science. What I am attempting to do is put some of the Cartesian metaphysical, epistemological, and methodological doctrines on which philosophers have concentrated in recent years into the perspective of Descartes' larger system.