

Descartes-Agonistes

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Physico-mathematics, Method &
Corpuscular-Mechanism 1618-33

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Preface

This work is a contribution to the historical literature both on Descartes and on the Scientific Revolution, particularly the crucial first half of the seventeenth century. It should not be confused with my earlier work on Descartes in my 1977 Princeton dissertation. Over the years I have seen that text cited a fair few times. I even recently encountered a colleague who reported having seen it referred to in print as some sort of ‘underground classic’. But rather than have readers cite that work, I would today prefer that they instead contemplate it as a vestige of how some history of science theses were constructed in departments of history in the 1970s.

Between 1981 and 1999 I published almost no first order research on the natural philosophical career of Descartes. The exception was my suite of papers (one in collaboration with Evelleen Richards) on how to model grand doctrines of method (including Descartes’) as ‘mythic speech’. That research was stimulated by the post-Kuhnian sociology of scientific knowledge of that period. In those years, beyond the work on method, I was more concerned with the historiography of the Scientific Revolution; problems of Bachelardian/Kuhnian theorizing of the rise of experimental fields; and, with the demands of course and degree structure design in history and philosophy of science, under the compulsion of which I eventually wrote two open access, introductory textbooks, one of which was recently revised for translation and publication in Mandarin.

In the late 1990s, initially prompted by suggestions and invitations from Stephen Gaukroger, I returned to Cartesian studies in the history of science. I was involved in the editing of two thematic collections about Cartesian science and natural philosophy, one with Gaukroger and John Sutton, the other with Peter Anstey. More importantly, since 2000 I have published a series of papers concerning Descartes’ optics, his hydrostatics (with Stephen Gaukroger), his vortex celestial mechanics, and (with Judit Brody) his previously little appreciated strategies of pro-Copernican systematisation in the *Principia philosophiae*. My ‘late twentieth century’ work on the structure, periodization and process of the Scientific Revolution has informed this work, along with another historiographical category that has been attracting attention in recent years. That is ‘physico-mathematics’, an actor’s term in the later sixteenth and early seventeenth century, first brought to the notice of historians of

science in an important way by the work of Peter Dear. Indeed, this category—decoded in the early work of Descartes and also elaborated as an historiographical theme—plays a central role in the present text, because this book is largely concerned with the trajectory of Descartes between 1618 and 1633: that is, from being a physico-mathematician who was seeking piecemeal corpuscular-mechanical grounding to his work, to becoming a corpuscular-mechanical systematiser with recognizable physico-mathematical conceptual stitches holding together large parts of the system. However, unlike my earlier approach to Descartes, in the present work that trajectory is now extended to include the *Principles of Philosophy*. There, based on my most recent research, in collaboration with Judit Brody, a novel and perhaps surprising interpretation is offered about Descartes' strategies of systematization and his enrolment of novel matters of fact—about sunspots, *novae* and variable stars—in the service of the very daring version of realist Copernicanism that text offers to the discerning reader, then and now.

In sum, then, my recent papers on Descartes, and my earlier work on his method, form the backbone of the present book, while those papers themselves draw upon my wider concerns with explaining the Scientific Revolution and with articulating and putting to work the category of physico-mathematics. Additionally, there are deployed in the present text some bits and pieces mined from my earliest work on Descartes. In almost all cases, however, that mining is not crude, nor are the extracts left unrefined. The historiographical categories and insights contained in my recent papers have determined how slices of my earliest work have been selected, shaped and placed in the present argument.

Accordingly, themes from my original dissertation which have not been topics of development in my intervening published work are revised extensively, if they reappear here. For example, in 1977 I had an overly optimistic view of the thesis concerning the 'crisis of the seventeenth century' and its relation to the rhythm of the Scientific Revolution (despite some terminological strictures against Popkin and Rabb mentioned at the time). I then passed through a long stage of deconstructivist scepticism about the entire notion, expressed only in conference and seminar papers, but not in print. However, I now return to it in modified form. It plays through my view of the 'inflection' (rather than rupture) in Descartes' career, identity structure and agenda, in 1629–1630, between the abandonment of the unfinished *Rules for the Direction of the Mind* and the emergence of the project of his first system of natural philosophy, *Le Monde*. Extending this approach in the present work, I endeavor to take stock of Descartes' self-understanding of his role and agenda at several key moments in his natural philosophical career; for example, when in 1618 he follows Isaac Beeckman into the alluring if under-determined realm of physico-mathematics; or when, soon after, he diverts along the ultimately delusional paths of *mathesis universalis* and universal method; or when, nearing completion of *Le Monde*, he momentarily oscillates between, on the one hand, still craving an '*a priori* science' and, on the other, bemoaning his lack of a 'complete natural history' of facts, necessary to ground his effort; or when he decides, in the *Principles of Philosophy*, vastly to outbid and out theorize even his younger self in the game of promoting a radical, infinite universe, realist Copernicanism.

All this further points to a characteristic and goal of the present book which I would hope all readers try to bear in mind as they proceed. This work, like almost all of my research, is deeply imbued with historiographical claims, insights and advice. The story, or at least my story, of the young Descartes' trajectory in natural philosophy, method and physico-mathematics could not have been told without the guidance, framing and explanatory fruits of my own career-long concern with historiographical problems and historical category formation in the history of science. I learned this style of problematising, and category formation and testing, from my initial mentors in the history of science, and early modern social and economic history—Tom Kuhn, Mike Mahoney, Ted Brown, Ted Rabb and Lawrence Stone. Some people discern in my historical style the overhang of a youth misspent in trying to become a physicist (whilst obsessively reading history of all kinds). It was this unpromising material on which these maestros of the Princeton History Department tried to work.

Those history of science colleagues who in the long time since then have been most important in influencing my work have been those who have in one way or another prompted my concerns along these lines, rather than, say, pointing out this or that Cartesian detail. Amongst these historiographical benefactors I would list Jerry Ravetz, Bob Westman, Floris Cohen, Wilbur Applebaum, Keith Hutchison, John Henry, Simon Schaffer, Richard Yeo, Peter Harrison and Peter Dear. But pride of place goes to Stephen Gaukroger, since the late 1970s my Cartesian sparring partner, occasional collaborator and constant exemplar of scholarly application and distinction.

My concerns with explanatory and interpretive resources and categories have always made me a consumer of cognate work in sociology of science, sociology of knowledge and other areas of history of science which might confer some heuristic guidance upon my own deliberations. These are patent in the present work. Over the years the most important contributions to my own 'concept formations' in these areas have come from the following (the last of whom I admit I never had the pleasure of meeting in person): Stephen Shapin (despite some tangential but overt differences over historical details), Barry Barnes, Trevor Pinch and Pierre Bourdieu. I also acknowledge the work of history of science/medicine/technology colleagues who have one way or another concretely affected or deflected my historiographical concerns: Ivan Crozier, David Mercer, Adam Lucas, Jan Golinski, Larissa Johnson Aldridge and Luciano Boschiero amongst former undergraduate or doctoral students of mine, as well as former or present colleagues, Evelleen Richards, Alan Chalmers, Barry Brundell, David Miller, Katherine Hill (Neal), Ofer Gal and Victor Boantz. When it comes to highly technical scientific issues, or tangled textual matters, rather than overtly historiographical questions, my debts are to such past and present history of science (or mathematics) masters as Alan Gabbey, Alan Shapiro, Jed Buchwald, Henk Bos, Eric Aiton and Bruce Eastwood.

For all the above reasons, the present book is not well categorized as history of philosophy. I was not professionally trained as an historian of philosophy, let alone as a philosopher as such. Of course, from the beginning I have benefitted from philosophers' research on Descartes, including even the oldest French Cartesian

scholarship from the turn of the last century: from Boutroux to Brunschvicg; from Gilson to Gueroult, from Mouy to Marion. To these we can add the burgeoning ranks of Anglophone historians of early modern philosophy who have worked on Descartes. In my case the most notable help has come from the works of Dan Garber (supplemented in person in his case), Roger Ariew, Des Clarke, Peter Machamer, Gary Hatfield and Denis Sepper. But, the philosopher who most shaped my approach to Descartes, and indeed to parts of history of science in general, was the late Gerd Buchdahl, a model colleague in the distant past, and, though he would have denied it, a master of historiographically relevant conceptualization, *malgré lui*.

Nevertheless, the exception of Buchdahl rather proves the rule, for I do not, in general, find amongst the cohorts of professional historians of early modern philosophy treatment of the same sorts of properly historical questions—relevant to micro as well as macro/comparative studies—that one finds amongst at least some historians of science, especially those trained in, and concerned with, other areas of general history. I very often benefit from the technical insights and wrangling of historians of philosophy, but I cannot think of more than a small number of occasions when an historiographical insight or problem of some import to this project has been stimulated by such a practitioner. Nor do I expect that the kinds of categories explored and deployed in this work in the service of an historical (partial) biography in context will be of particular interest or relevance within the empire of history of philosophy. However, exceptions will be welcomed and engaged, as they always have been.

A simple glance at the contents of Chap. 2, my initial statement of key concepts and historiographical issues that will be deployed and articulated throughout the work, will show this. In compensation I expect that the sort of categories and models set up there will interest, or usefully incense, intellectual and social historians and historians of science concerned with how nature-knowledge disciplines develop and interact with each other and their wider contexts. In short, while I hope historians of philosophy read (at least parts of) this book, I am speaking as an historian—with wide and eclectic interests in that discipline beyond mere, say, history of physics or natural philosophy—to historians, in a language of questions, concepts and categories, many of my own making or revision, which remains unremittingly historical.¹

In closing, I must acknowledge one philosopher whose work, more than any other, haunts my present effort—and my earlier one. That scholar is the redoubtable Norman Kemp Smith, whose *New Studies in the Philosophy of Descartes* (1952) gave me my first clues about how to deal historically with the young Descartes. I picked up that work in 1972 on the prompting of Tom Kuhn, who had written a positive review of it in *Isis* in 1955, when he himself was contemplating a scientific biography of Descartes. Many reading this Preface will know that Kemp Smith had

¹ Any historian of philosophy reading this might refer to my short review of Ted McGuire and Peter Machamer's recent brilliant rational reconstruction of the 'mature Descartes' in *Descartes' Changing Mind* (2009) to see how I envision the difference between their work and any instance of a suite of possible historical approaches, whilst granting the complete legitimacy of their terms of discourse. *Renaissance Quarterly* 63 (2010): 579–581.

two attempts at the study of Descartes. His *New Studies* post dated his original *Studies in the Cartesian Philosophy* by 51 years. Perhaps Descartes exercises a certain compulsion upon some of his scholars. After all, I am here presenting my second attempt at ‘a Descartes for historians of science’—and students of history in general—following a gap of a mere 35 years. I say this not in any way to equate my efforts with those of Kemp Smith, but simply to acknowledge the effect of his second book on me at my most formative moment, and to register the fact that such Cartesian obsession, with which I might well be charged, is neither unprecedented, nor necessarily unfruitful.

Mount Keira

John Schuster

A note on the use of this book: A glance at the table of contents of this volume and a reading of Sect. 1.4, ‘Overview of Argument’ will show that, despite its length, this book embodies a tightly knit, and highly iterative, argument. The key categories and frames of interpretation, as well as the central questions addressed, are treated intensively, rather than diffusely. Core questions and concepts recur during the course of the narrative with increasing articulation and contextualization. Two of the chapters, Chaps. 2 and 6, are largely devoted to exposition of interpretative concepts and frames required at those stages of the argument. There is a high level of internal cross referencing both within chapters and between sections and sub-sections of differing chapters. Use of the table of contents, which has over 160 entries, and the extensive internal cross referencing, provide the best reader’s map to both the pattern of the argument and its underlying conceptual architecture. These resources also make perfectly clear where key figures other than Descartes enter the story. Additionally, many readers will be approaching this volume in its digital manifestation, rendering it easy to design one’s own complete searches for topics, persons and categories.

All these facts conduced to the decision not to provide a standard index, a piece of apparatus that tends to enforce a particular and atomized picture of the contents of a book. That may be appropriate to factually exhaustive and circumstantially rich discourses. But, it does not suit works such as this, which attempts a detailed narrative *cum* explanation of Descartes’ activities in a limited number of intellectual disciplines, the narrative/explanation being shaped by, and iteratively articulating, a number of historiographical concepts and frames of interpretation, some of which began life as contemporary actors’ categories. Readers should note that internal cross references to specific sections of this book (rather than to entire chapters), always use the full numerical code for the section in question, as it appears in the Table of Contents: the first numeral always denotes the chapter, the second the section and the third, if needed, the sub-section. Thus, a cross reference to ‘Sect. 8.2.1’ refers the reader to Chapter 8, Section 2, Sub-Section 1. This protocol applies to cross references in the text and in footnotes, and even to cross references within a given chapter.

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