

DESCARTES ON FORMS AND MECHANISMS

The modern view of causation can be traced back to the mechanistic science of Descartes, whose rejection of Aristotelian physics, with its concept of substantial forms, in favor of mechanical explanation was a turning point in the history of philosophy. However, the reasoning which led Descartes and other early moderns in this direction is not well understood. For the first time, this book traces Descartes' groundbreaking theory of scientific explanation back to the mathematical demonstrations of Aristotelian mechanics and interprets these advances in light of the available arguments for and against substantial forms. It also examines how Descartes' new theory led him to develop a metaphysical foundation for his science that could avoid skeptical objections. It will appeal to a wide range of readers interested in the philosophy and science of the early modern period.

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Cambridge University Press & Assessment
 978-0-521-51892-5 — Descartes on Forms and Mechanisms
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Shaftesbury Road, Cambridge CB2 8EA, United Kingdom
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 Information on this title: www.cambridge.org/9780521518925

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First published 2009
 First paperback edition 2011

A catalogue record for this publication is available from the British Library

Library of Congress Cataloging-in-Publication data
 Hattab, Helen.

Descartes on forms and mechanisms / Helen Hattab.
 p. cm.

Includes bibliographical references (p. 226) and index.

ISBN 978-0-521-51892-5 (hardback)

1. Descartes, René, 1596–1650. 2. Mechanism (Philosophy)
 3. Form (Philosophy) 4. Scholasticism. I. Title.

B1878.M43H38 2009

III.092–dc22

2009016997

ISBN 978-0-521-51892-5 Hardback
 ISBN 978-1-107-40515-8 Paperback

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To my father, Stephan Andel

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Acknowledgments

I may be the proximate efficient cause of this work, but many other causes were involved in its generation. Prior studies of Descartes and his context provided me with exemplars of what I could only aspire to attain. In particular, over the years, I have benefited both from the scholarly examples and from the personal encouragement offered by Roger Ariew, Dennis Des Chene, and Dan Garber. A series of fellowships provided the material resources to translate my aspirations into actualities. A National Endowment for the Humanities summer seminar on “Descartes and His Contemporaries” directed by Dan and Roger first sparked my interest in the Aristotelian *Mechanica* tradition. My participation in an NEH Summer Institute in Washington DC, directed by Pam Long and Pam Smith the following summer, put me in the vicinity of rare book collections that could satisfy my curiosity. The two Pams, as we affectionately called them, were both excellent role models as I began my historical forays into Aristotelian *Mechanica* commentaries. My investigations advanced significantly thanks to a residential research grant from the Dibner Library of the History of Science and Technology at the Smithsonian Institution in the spring of 2004. Ron Brashear, then the director of the Dibner Library, and his assistants, Kirsten van der Veen and Daria Wingreen-Mason, provided invaluable assistance and support both during and after my residency. The remaining research for this book was completed thanks to residential fellowships at the Herzog August Bibliothek in Wolfenbüttel, Germany, in the summer of 2005; the Scaliger Institute in Leiden, the Netherlands, in the summer of 2007; and the Folger Shakespeare Library in Washington DC in fall 2007. I thank all the staff who assisted me, especially Dr. Gillian Bepler and Mr. Kaspar van Ommen, who oversaw the nuts and bolts of the fellowship programs at the Herzog August Bibliothek and Scaliger Institute, respectively.

The year in which this book was conceived was also the year when I was first confronted with a painful, long-term physical illness. There were

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many times when I thought I would never have the strength to complete this project. At crucial stages, my load was significantly lightened by two excellent research assistants. Jessica Weiss assisted me in translating some of the *Mechanica* commentaries from Latin to English in 2004, most notably that of Ioannis de Guevara, cited in this work. Francesca Bruno, my student at the University of Houston, received a Summer Undergraduate Research Fellowship in 2006 to study Bernardino Telesio's *De rerum natura* and the secondary literature on Telesio's influence under my supervision. While most of this material had to be cut from the final version of this book, the conclusions I reached about Telesio draw on the work Francesca did for me. I could not have wished for two better assistants than Jessica and Francesca – both were far more dedicated than the remuneration I was able to give them warranted. I consider myself extremely fortunate to have colleagues and graduate students at the University of Houston who took an active interest in my research. Drafts of select chapters were presented to the Philosophy Department at the University of Houston and the Houston Circle for the Study of Early Modern Philosophy, as well as meetings of the International Society for Intellectual History, the Mid Atlantic Seminar in Early Modern Philosophy and the History of Science Society. I thank all those who participated for their feedback. I would like to add a special thanks to my fellow co-founders of the Houston Circle, Greg Brown and Mark Kulstad, for all our stimulating discussions of early modern philosophy, and to my Chair, Cynthia Freeland, who provided comments on the Aristotelian chapters. Finally, the detailed feedback from anonymous referees and the invaluable assistance of my editor, Hilary Gaskin, gave this work its final form. I thank them for their time and effort, and for this opportunity to publish the fruits of my research.

Last but not least, I will always be grateful to my family, and especially my husband, Jim Hattab, for being there to offer encouragement and support while I juggled the seemingly impossible demands of my career and illness. There ought to be a special medal for partners who remain unwavering in their devotion, while their loved one turns into a basketcase! In the absence of a medal, I can only offer my undying thanks.

Abbreviations

AT	<i>Oeuvres de Descartes</i> , ed. Charles Adam and Paul Tannery, 12 vols. (Paris: Vrin, 1996).
CAM	St. Thomas Aquinas, <i>Commentary on Aristotle's Metaphysics</i> , trans. John P. Rowan (Notre Dame, IN: Dumb Ox Books, 1961).
CSM	René Descartes, <i>The Philosophical Writings of Descartes</i> , vols. I and II, trans. John Cottingham, Robert Stoothoff, and Dugald Murdoch (Cambridge: Cambridge University Press, 1985).
CSMK	René Descartes, <i>The Philosophical Writings of Descartes</i> , vol. III, trans. John Cottingham, Robert Stoothoff, Dugald Murdoch, and Anthony Kenny (Cambridge: Cambridge University Press, 1991).
MD7	Francisco Suarez, <i>Francisco Suarez on the Various Kinds of Distinctions</i> , trans. Cyril Vollert (Milwaukee, WI: Marquette University Press, 1947).
MD15	Francis Suarez, <i>On the Formal Cause of Substance: Metaphysical Disputation XV</i> , trans. John Kronen and Jeremiah Reedy (Milwaukee, WI: Marquette University Press, 2000).
PP	René Descartes, <i>Principles of Philosophy</i> , trans. V. R. Miller and R. P. Miller (Dordrecht: D. Reidel Publishing Co., 1983).
QNS	Francisco Sanches, <i>That Nothing Is Known</i> , ed. Elaine Limbrick and Douglas F. S. Thomson (Cambridge: Cambridge University Press, 1998).
SCG	St. Thomas Aquinas, <i>Summa Contra Gentiles</i> , trans. James F. Anderson, 4 vols. (Notre Dame: University of Notre Dame Press, 1975).
ST	St. Thomas Aquinas, <i>The Summa Theologica of St Thomas Aquinas</i> , trans. Fathers of the Dominican Province (London: R. & T. Washbourne, 1912).