The Pythagorean World

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Why Mathematics Is Unreasonably Effective In Physics

palgrave
macmillan

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ISBN 978-3-319-40975-7 ISBN 978-3-319-40976-4 (eBook)
DOI 10.1007/978-3-319-40976-4

Library of Congress Control Number: 2016957514

Cover illustration: © Purcell Pictures, Inc. / Alamy Stock Photo

Printed on acid-free paper

This Palgrave Macmillan imprint is published by Springer Nature
The registered company is Springer International Publishing AG Switzerland
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Preface

Don't be surprised then, Socrates, if it turns out repeatedly that we won't be able to produce accounts on a great many subjects—on gods or the coming to be of the universe—that are completely and perfectly consistent and accurate. Instead, if we can come up with accounts no less likely than any, we ought to be content, keeping in mind that both I, the speaker, and you, the judges, are only human.

Plato, *Timaeus* 29c

Acknowledgements

Many people helped with the preparation of this book. The following deserve special recognition.

Thanks to Graham Oppy for invaluable discussions, comments, suggestions and direction. Thanks to Monima Chadha for her encouragement. Thanks to the students and staff of the Monash University Philosophy Department for general support and assistance. Thanks to Robert Griffiths for patiently answering my questions about consistent histories quantum mechanics. Thanks to the examiners of my thesis, Eric Steinhart and Peter Forrest, for their suggested improvements.

My special thanks go to my husband, Michael McDonnell, for his critical insights. Without his support, this book would not have been possible.

Any and all mistakes or omissions are mine alone.

Abstract In this book, I argue that many problems in the philosophy of science and mathematics (in particular, the unreasonable effectiveness of mathematics in physics) can only be addressed within a broader metaphysical framework which provides a coherent world view. I attempt to develop such a framework and draw out its consequences. The attempt is in two parts: firstly, I develop a speculative framework based on an analogy to set theory, then I combine elements of the framework with ideas from Leibnizian monadology and consistent histories quantum theory to introduce (what I call) quantum monadology. The two parts focus on different aspects of the problem and should be viewed as stages on the way to a final formulation. The inspiration for the book came from Plato's *Timaeus* and Wigner's comments on quantum mechanics. As it turned out, Leibniz's *Monadology* became a third key source.

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