REALISM FOR REALISTIC PEOPLE

In this innovative book, Hasok Chang constructs a philosophy of science for ‘realistic people’ interested in understanding and promoting the actual practices of inquiry in science and other knowledge-focused areas of life. Inspired by pragmatist philosophy, he reconceives the very notions of reality and truth on the basis of his concept of the ‘operational coherence’ of epistemic activities and offers new pragmatist conceptions of truth and reality as operational ideals achievable in actual scientific practice. Rejecting the version of scientific realism that is concerned with claiming that our theories correspond to an ultimate reality, he proposes instead an ‘activist realism’: a commitment to do all that we can actually do to improve our knowledge of realities. His book will appeal to scholars and students in philosophy, science and the history of science, and all who are concerned about the place of science and empirical truth in society.

HASOK CHANG is the Hans Rausing Professor of History and Philosophy of Science at the University of Cambridge. He is the author of Inventing Temperature: Measurement and Scientific Progress (2004), joint winner of the 2006 Lakatos Award, and of Is Water H₂O? Evidence, Realism and Pluralism (2012).
REALISM FOR REALISTIC PEOPLE

A New Pragmatist Philosophy of Science

HASOK CHANG

University of Cambridge
To Gretchen Siglar,
for her curiosity, her insight and her love
# Contents

<table>
<thead>
<tr>
<th>List of Illustrations</th>
<th>page ix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acknowledgements</td>
<td>x</td>
</tr>
</tbody>
</table>

## Introduction

- What Is the Problem?  
  - Pragmatist Notions of Knowledge, Truth and Reality  
  - Scientific Realism as Realistic Activism  
  - What Kind of Book Is This?  
  - A Note on Structure  

### 1 Active Knowledge

- 1.1 Overview  
- 1.2 Epistemic Agents  
- 1.3 Epistemic Activities and Systems of Practice  
- 1.4 Operational Coherence  
- 1.5 Inquiry as Aim-Oriented Adjustment  
- 1.6 Pragmatism and Active Knowledge  

### 2 Correspondence

- 2.1 Overview  
- 2.2 Correspondence Realism: Between Metaphysics and Semantics  
- 2.3 Can Reference Save Correspondence Realism?  
- 2.4 Faith in Science  
- 2.5 Real Representations  

### 3 Reality

- 3.1 Overview  
- 3.2 How Mind-Framing Works  
- 3.3 The Achievement of Reality  
- 3.4 Ontological Pluralism  
- 3.5 Putting Things Together  

---

© in this web service Cambridge University Press & Assessment  
www.cambridge.org
## Contents

4 Truth
   4.1 Overview 163
   4.2 Different Kinds of Truth 163
   4.3 Empirical Truth and Operational Coherence 173
   4.4 Truth as a Quality 179
   4.5 Plurality and Incommensurability 186
   4.6 Rehabilitating the Pragmatists 192

5 Realism
   5.1 Overview 204
   5.2 Pragmatism and Realism 216
   5.3 Internal and Perspectival Realism 223
   5.4 Pluralism and Realism 231
   5.5 Epistemic Iteration Revisited 239
   5.6 Progress and the Scientific Realism Debate 247

Closing Remarks
   A Humanist Vision of Knowledge 252
   The Road Ahead 253
   Bringing Philosophy Back to Life 254

Bibliography 256
Index 275
Illustrations

1.1 An experimental arrangement demonstrating the electromagnetic effect first discovered by Hans Christian Ørsted  page 52
1.2 Faraday’s compact rotation device  55
2.1 Ball-and-stick molecular models by August Hofmann  112
So many people have helped in the making of this book that I will not be able to list anywhere near all of them here. I will do my best to note my most salient debts, with apologies and thanks to all those who will have to go unnamed.

First of all I want to thank all of my family members near and far for being there for me, especially my parents back in Seoul, whose steadfast love and support never will wane.

I could never have completed this project without the privilege of a three-year research leave that I enjoyed as a British Academy Wolfson Research Professor. Being selected for this honour also gave me the assurance that this project was worth doing. I thank the British Academy and the Wolfson Foundation most sincerely.

I would like to thank all the people at Cambridge University Press who helped bring this book out into this world. Most of all I thank Hilary Gaskin for her long-term encouragement and support, and patience with my changing plans and ever-slipping schedule. I would also like to thank Neena Maheen and colleagues at Straive for the production work. And Damian Love’s expert and meticulous attention in copyediting has been a true blessing.

This book could not at all have become what it is without the generous help of Philip Kitcher, who encouraged and instructed me in this direction of work for many years. Crucially, he helped me gain the British Academy award, reviewed the proposal for this book and then the full manuscript for the press, and gave me what I will always think of as the shining exemplar of constructive criticism. And he did it all without ever having any obligation to mentor me. In a very similar vein I would also like to record my deep thanks to Martin Carrier.

Equally indispensable has been the help from my ‘Angels’ (PhD students and others), who worked as my ‘pacemakers’ as I raced to make the first full draft of this book, and gave me endless advice and encouragement.

x
Those weekly Zoom meetings through the coronavirus pandemic will live forever in my fond memory. I thank especially Céline Henne, Oscar Westerblad, Helene Scott-Fordsmand, Emilie Skulberg and Bob Vos; equally insightful feedback, though less extensive, came from Sarah Hijmans, Milena Ivanova, Hannah Tomczyk, Agnes Bolinska, and Grace Field. I also thank Daniel Ott, Rory Kent and Henrique Gomes for their contributions. The Angels also continue to be my own European Union through the dark days of Brexit.

Similarly, at earlier stages of work, groups at some leading centres of philosophy of science have provided memorable formative occasions for my work on this project. I will always remember with great appreciation the seminars and reading groups at Bielefeld (hosted by Martin Carrier), Tartu (Ave Mets and Endla Lõhkivi), Edinburgh (Michela Massimi) and UCL/LSE (Chiara Ambrosio and Roman Frigg). Also important have been occasions to present my work at the Aristotelian Society (Hannah Carnegy, Guy Longworth), Leeds (Greg Radick), Hanyang University (Sang Wook Yi), Vienna (Martin Kusch, Fritz Stadler, Elisabeth Nemeth), Ghent (Erik Weber), Oxford (Simon Saunders, Harvey Brown), TU-Berlin (Friedrich Steinele), Pardubice (Filip Grygar), Pittsburgh (Sandy Mitchell), LOGOS and UAB in Barcelona (Carl Hoefer, Genoveva Martí, Thomas Stürm and Silvia de Bianchi), Bern (Andrea Loettgers), Simon Fraser (Holly Andersen), Toronto (Hakob Barseghyan), Montevideo (Lucía Lewowicz) and many other places, as well as various conference series including SPSP, &HPS, PSA, CLMPST and the European Pragmatism Conference. I thank not only the people named above as my main hosts, but many others who lent me their thoughts and ears on all those occasions.

There are a number of other people that I would like to thank for their helpful critical and constructive feedback on earlier versions of various parts of this book over many years. It is impossible to mention all of them, but I especially want to mention Nancy Cartwright, Roberto Torretti, Paul Teller, Miriam Solomon, Léna Soler, Jamie Shaw, Mike Stuart, Alison Wylie, Sabina Leonelli, Jeremy Butterfield; and also Anna Alexandrova, Rachel Ankeny, Theodore Arabatzis, Marina Banchetti, Ann-Sophie Barwich, Mieke Boon, Karim Bschir, Julia Bursten, Anjan Chakravartty, Alan Chalmers, Mazviita Chirimuuta, Stijn Conix, Claudia Cristalli, Adrian Currie, Henk de Regt, Stuart Firestein, Dagfinn Føllesdal, Peter Galison, Marta Halina, Clevis Headley, Robin Hendry, Gerald Holton, Phyllis Illari, Alistair Isaac, Katie Kendig, Ken Kendler, Helen Lauer, Tim Lewens, Geoffrey Lloyd, Cheryl Misak, Miguel Ohnesorge, Themis
Acknowledgements


Nearer home, I thank my colleagues, students and other members and associates of the Department of History and Philosophy of Science at the University of Cambridge for providing a most congenial and stimulating intellectual environment and first-rate library resources and administrative support.

Through all these interactions and many others, I have felt that a certain global scholarly village felt the need for a book like this, and somehow nominated me to write it. In actual practice this meant that when I presented earlier versions of the material contained in this book, so many of you encouraged me so enthusiastically but also told me that I needed to do more, and better. I especially have in mind the community that formed through the Society for Philosophy of Science in Practice (SPSP). This book is for you, and I hope it is worth the wait.