

Boston Studies in the Philosophy and History of Science

Volume 319

Series editors

Alisa Bokulich, Boston University

Robert S. Cohen, Boston University

Jürgen Renn, Max Planck Institute for the History of Science

Kostas Gavroglu, University of Athens

The series *Boston Studies in the Philosophy and History of Science* was conceived in the broadest framework of interdisciplinary and international concerns. Natural scientists, mathematicians, social scientists and philosophers have contributed to the series, as have historians and sociologists of science, linguists, psychologists, physicians, and literary critics.

The series has been able to include works by authors from many other countries around the world.

The editors believe that the history and philosophy of science should itself be scientific, self-consciously critical, humane as well as rational, sceptical and undogmatic while also receptive to discussion of first principles. One of the aims of *Boston Studies*, therefore, is to develop collaboration among scientists, historians and philosophers.

Boston Studies in the Philosophy and History of Science looks into and reflects on interactions between epistemological and historical dimensions in an effort to understand the scientific enterprise from every viewpoint.

More information about this series at <http://www.springer.com/series/5710>

Tilman Sauer · Raphael Scholl
Editors

The Philosophy of Historical Case Studies

 Springer

Editors

Tilman Sauer
Institute of Mathematics
Johannes Gutenberg University Mainz
Mainz
Germany

Raphael Scholl
Department of History and Philosophy
of Science
University of Cambridge
Cambridge
UK

ISSN 0068-0346

ISSN 2214-7942 (electronic)

Boston Studies in the Philosophy and History of Science

ISBN 978-3-319-30227-0

ISBN 978-3-319-30229-4 (eBook)

DOI 10.1007/978-3-319-30229-4

Library of Congress Control Number: 2016934433

© Springer International Publishing Switzerland 2016

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made.

Printed on acid-free paper

This Springer imprint is published by Springer Nature

The registered company is Springer International Publishing AG Switzerland

Contents

1	Introduction	1
	Tilman Sauer and Raphael Scholl	
Part I The Relations Between History of Science and Philosophy of Science		
2	How to Save the Symmetry Principle	11
	Michael Bycroft	
3	“Baseline” and “Snapshot”: Philosophical Reflections on an Approach to Historical Case Studies	31
	Giora Hon	
4	Two Modes of Reasoning with Case Studies	49
	Wolfgang Pietsch	
5	Towards a Methodology for Integrated History and Philosophy of Science	69
	Raphael Scholl and Tim Rüz	
Part II Controversies Reconsidered		
6	Two Kinds of Case Study and a New Agreement	95
	Allan Franklin and Harry Collins	
7	Pluralism in Historiography: A Case Study of Case Studies	123
	Katherina Kinzel	
8	Contrasting Cases: The Lotka-Volterra Model Times Three	151
	Tarja Knuutila and Andrea Loettgers	
9	Gone Till November: A Disagreement in Einstein Scholarship	179
	Tim Rüz	

Part III Integration in Practice

10	From Discrepancy to Discovery: How Argon Became an Element	203
	Theodore Arabatzis and Kostas Gavroglu	
11	“So How Do We Know that the Moon Is Mountainous?” Problems of Seeing in Galileo’s Reflections on Observing the Moon	223
	Simone De Angelis	
12	Multiple Perspectives on the Stern-Gerlach Experiment	251
	Tilman Sauer	
13	From Zymes to Germs: Discarding the Realist/Anti-Realist Framework	265
	Dana Tulodziecki	
14	Heisenberg’s <i>Umdeutung</i>: A Case for a (Quantum-)Dialogue Between History and Philosophy of Science	285
	Adrian Wüthrich	

Contributors

Theodore Arabatzis Department of History and Philosophy of Science, University of Athens, Athens, Greece

Michael Bycroft Department of History, University of Warwick, Coventry, UK

Harry Collins Distinguished Research Professor of Sociology, Cardiff University, Cardiff, UK

Simone De Angelis Zentrum für Wissenschaftsgeschichte, Universität Graz, Graz, Austria

Allan Franklin Department of Physics, University of Colorado, Boulder, USA

Kostas Gavroglu Department of History and Philosophy of Science, University of Athens, Athens, Greece

Giora Hon Department of Philosophy, University of Haifa, Haifa, Israel

Katherina Kinzel Institut für Philosophie, Universität Wien, Vienna, Austria

Tarja Knuuttila Department of Philosophy, University of South Carolina, Columbia, USA

Andrea Loettgers Center for Space and Habitability, University of Bern, Bern, Switzerland; Department of Philosophy, University of Geneva, Geneva, Switzerland

Wolfgang Pietsch Munich Center for Technology in Society, Technical University Munich, Munich, Germany

Tim Räs FB Philosophie, University of Konstanz, Konstanz, Germany

Tilman Sauer Institute of Mathematics, Johannes Gutenberg University Mainz, Mainz, Germany

Raphael Scholl Department of History and Philosophy of Science, University of Cambridge, Cambridge, UK

Dana Tulodziecki Department of Philosophy, Purdue University, West Lafayette, USA

Adrian Wüthrich Institut für Philosophie, Literatur-, Wissenschafts- und Technikgeschichte, Technische Universität Berlin, Berlin, Germany