

ABSTRACTS

ESTRATTO

da

PHYSIS

Rivista Internazionale di Storia della Scienza

2022/2 ~ (LVII)



Leo S. Olschki Editore
Firenze

physics

International Journal for the History of Science

LVII

2-2022



physis

International
Journal for
the History of
Science

pubblicata dalla

DOMUS GALILÆANA DI PISA

in collaborazione con

SOCIETÀ ITALIANA DI STORIA DELLA SCIENZA
SEMINARIO DI STORIA DELLA SCIENZA DELL'UNIVERSITÀ DI BARI

DIREZIONE E REDAZIONE

(EDITORS)

Direttore responsabile (Senior Editor): STEFANO CARRAI.

Direttori (Editors): FRANCESCO PAOLO DE CEGLIA, CARLA RITA PALMERINO, CLAUDIO POGLIANO.

Comitato direttivo (Editorial Board): MONICA AZZOLINI, MARCO BRESADOLA, MAURO CAPOCCI, GIOVANNI DI PASQUALE, RENATO FOSCHI, SERGIO GIUDICI, LUIGI INGALISO, SANDRA LINGUERRI, ERIKA LUCIANO, ELIO NENCI.

Responsabili delle recensioni (Book Reviews Editors): ANDREA CANDELA, GIULIA GIANNINI, MATTIA MANTOVANI.

Redazione (Editorial Office): DAVID CECCARELLI, LUCIA DE FRENZA.

CONSIGLIO SCIENTIFICO

(ADVISORY BOARD)

MAURO ANTONELLI, GIULIO BARSANTI, MARCO BERETTA, DOMENICO BERTOLONI MELI, PAOLA BERTUCCI, JANET BROWNE, ELENA CANADELLI, LUCA CIANCIO, MARCO CIARDI, GUIDO CIMINO, ANTONIO CLERICUZIO, MARIA CONFORTI, BARBARA CONTINENZA, VINCENZO DE RISI, FEDERICA FAVINO, PAULA FINDLEN, PAOLO GALLUZZI, PAOLA GOVONI, NICCOLÒ GUICCIARDINI, MICHAEL HAGNER, NICK HOPWOOD, MARIANNE KLEMUN, MATTEO MARTELLI, RENATO G. MAZZOLINI, MASSIMO MAZZOTTI, MARIA MONTSERRAT CABRÉ PAIRET, CARMELA MORABITO, STAFFAN MÜLLER-WILLE, GIULIANO PANCALDI, IRINA PODGORNYY, GIANNA POMATA, TELMO PIEVANI, CLAUDIA PRINCIPE, PIETRO REDONDI, HANS-JÖRG RHEINBERGER, ANTONELLA ROMANO, PAOLO ROSSI, SOPHIE ROUX, DAGMAR SCHÄFER, EZIO VACCARI, STÉPHANE VAN DAMME.

E-MAIL: francescopaolo.deceglia@uniba.it

2023: ABBONAMENTO ANNUALE (2 fascicoli) – ANNUAL SUBSCRIPTION (2 issues)

Il listino prezzi e i servizi per le **Istituzioni** sono disponibili sul sito www.olschki.it alla pagina <https://www.olschki.it/acquisti/abbonamenti>

Subscription rates and services for Institutions are available on

<https://en.olschki.it/> at following page:

<https://en.olschki.it/acquisti/abbonamenti>

PRIVATI

Italia € 117,00 (carta e on-line only)

INDIVIDUALS

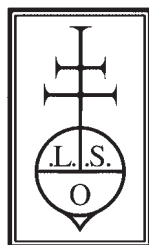
Foreign € 154,00 (print) • € 117,00 (on-line only)

physics

International Journal for the History of Science

LVII

2-2022



LEO S. OLSCHKI EDITORE
FIRENZE

physics

International
Journal for
the History of
Science

pubblicata dalla
DOMUS GALILÆANA DI PISA
in collaborazione con
SOCIETÀ ITALIANA DI STORIA DELLA SCIENZA
SEMINARIO DI STORIA DELLA SCIENZA DELL'UNIVERSITÀ DI BARI

DIREZIONE E REDAZIONE (EDITORS)

Direttore responsabile (Senior Editor): STEFANO CARRAI.

Direttori (Editors): FRANCESCO PAOLO DE CEGLIA, CARLA RITA PALMERINO, CLAUDIO POGLIANO.

Comitato direttivo (Editorial Board): MONICA AZZOLINI, MARCO BRESADOLA, MAURO CAPOCCI, GIOVANNI DI PASQUALE, RENATO FOSCHI, SERGIO GIUDICI, LUIGI INGALISO, SANDRA LINGUERRI, ERIKA LUCIANO, ELIO NENCI.

Responsabili delle recensioni (Book Reviews Editors): ANDREA CANDELA, GIULIA GIANNINI, MATTIA MANTOVANI.

Redazione (Editorial Office): DAVID CECCARELLI, LUCIA DE FRENZA.

CONSIGLIO SCIENTIFICO (ADVISORY BOARD)

MAURO ANTONELLI, GIULIO BARSANTI, MARCO BERETTA, DOMENICO BERTOLONI MELI, PAOLA BERTUCCI, JANET BROWNE, ELENA CANADELLI, LUCA CIANCIO, MARCO CIARDI, GUIDO CIMINO, ANTONIO CLERICUZIO, MARIA CONFORTI, BARBARA CONTINENZA, VINCENZO DE RISI, FEDERICA FAVINO, PAULA FINDLEN, PAOLO GALLUZZI, PAOLA GOVONI, NICCOLÒ GUICCIARDINI, MICHAEL HAGNER, NICK HOPWOOD, MARIANNE KLEMUN, MATTEO MARTELLI, RENATO G. MAZZOLINI, MASSIMO MAZZOTTI, MARIA MONTSERRAT CABRÉ PAIRET, CARMELA MORABITO, STAFFAN MÜLLER-WILLE, GIULIANO PANCALDI, IRINA PODGORNÝ, GIANNA POMATA, TELMO PIEVANI, CLAUDIA PRINCIPE, PIETRO REDONDI, HANS-JÖRG RHEINBERGER, ANTONELLA ROMANO, PAOLO ROSSI, SOPHIE ROUX, DAGMAR SCHÄFER, EZIO VACCARI, STÉPHANE VAN DAMME.

E-MAIL: francescopaolo.deceglia@uniba.it

Ogni articolo è sottoposto alla valutazione anonima di due esperti.
Each article is submitted to a double-blind scholarly peer review.

PHYSIS

INTERNATIONAL JOURNAL FOR THE HISTORY OF SCIENCE

Vol. LVII (2022)

Fasc. 2

TABLE OF CONTENTS

F. FAVINO, G. GIANNINI, Borelli Reloaded: Contexts and Networks in 17th-Century Italy	pag. 289
<i>1. Borelli's Scholarly Work: Mathesis, Natural Philosophy, and Antiquarianism</i>	
V. DE RISI, Euclid Upturned: Borelli on the Foundations of Geometry	» 301
C.R. PALMERINO, Gravity, Magnetism, Elasticity: the Role of Spontaneous Motion in Borelli's Mechanical Philosophy	» 331
L. TONETTI, Malpighi's Early Views on Brain Anatomy: a Look at His Unpublished Drawings and Notes	» 357
F. FAVINO, Borelli and the Ancient Triremes: Antiquarianism and Political Commitment	» 377
<i>2. Context and Rivalries in Borelli's Scientific Journey</i>	
R. RAPHAEL, Reading Experiment in 17th-Century Pisa: between University and Academy	» 401
N. CASTEL-BRANCO, Who Was Borelli Responding to? Nicolaus Steno in <i>De motu animalium</i> (Rome, 1680-1681).	» 431
S.D. PRIMBAULT, A Posthumous Rivalry: on Borelli and Viviani's Relationship between the Accademia del Cimento and an Eighteenth-Century Controversy	» 449
G. GIANNINI, Giovanni Alfonso Borelli and the Books of Others: a Contribution to the Reconstruction of Borelli's Library	» 475
Ricordo di Carlo Maccagni (1932-2022)	» 515
Ricordo di Raffaella Simili (1945-2022).	» 519

Book Reviews

- M. MALPANGOTTO, *Theoricae novae planetarum Georgii Peurbachii dans l'histoire de l'astronomie* (O. Akopyan) – M. TORRINI, *Galileo nel tempo* (S. Ricciardo) – M. STORNI, *Maupertuis: Le philosophe, l'académicien, le polémiste* (P.D. Omodeo) – E. PROVERBIO, *Il contesto in cui Ruggiero Giuseppe Boscovich maturò la decisione di trasferirsi in Francia nel 1773: Fatti e personaggi* (L. Guzzardi) – C.N. JOHNSON, *Darwin's "Historical Sketch." An Examination of the 'Preface' to the Origin of Species* (D. Ceccarelli) – S. BLUME, *Immunization: How Vaccines Became Controversial* (M. Capocci)..... pag. 521

FEDERICA FAVINO * – GIULIA GIANNINI **

BORELLI RELOADED:
CONTEXTS AND NETWORKS IN 17TH-CENTURY ITALY

* Sapienza Università di Roma, Dipartimento di Storia Antropologia Religioni Arte e Spettacolo, Piazzale Aldo Moro 5, Rome, Italy, e-mail: federica.favino@uniroma.it. This research received funds by the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 799769.

** Università degli Studi di Milano, Dipartimento di Studi Storici, Via Festa del Perdono 7, Milan, Italy, e-mail: giulia.giannini1@unimi.it. This work is part of a project that has received funding from the European Research Council (ERC) within the framework of the European Union's Horizon 2020 research and innovation program (TACITROOTS, PI: Giulia Giannini, Grant agreement No. 818098).

PART 1

BORELLI'S SCHOLARLY WORK:
MATHESIS, NATURAL PHILOSOPHY,
AND ANTIQUARIANISM

VINCENZO DE RISI *

EUCLID UPTURNED:
BORELLI ON THE FOUNDATIONS OF GEOMETRY

ABSTRACT – The article discusses Borelli's studies on the foundations of mathematics. Borelli's *Euclides Restitutus* (1658) is one of the most significant books on elementary geometry in the early modern age, and it fundamentally changed the way of approaching Euclid's text. The article examines Borelli's epistemology, his theory of definitions, the system of axioms employed in the *Euclides*, and the new deductive structure of the work. These analyses show that Borelli's *Euclides* can be considered one of the earliest modern texts on elementary mathematics.

* Laboratoire SPHère, CNRS, Paris, France / Max-Planck-Institut für Wissenschaftsgeschichte, Berlin, Germany; e-mail: vincenzoderisi@gmail.com

CARLA RITA PALMERINO *

GRAVITY, MAGNETISM, ELASTICITY:
THE ROLE OF SPONTANEOUS MOTION
IN BORELLI'S MECHANICAL PHILOSOPHY

ABSTRACT – This article analyses Borelli's account of gravity, magnetism and the elasticity of air in the *De vi percussiois* (1667) and *De motionibus naturalibus a gravitate pendentibus* (1670), with the aim of elucidating the ontological status of moving forces in his mechanical philosophy. Borelli criticizes Gassendi's and Descartes's reduction of all physical action to contact action, and argues for the existence of intrinsic motive virtues, which he locates in the spirituous particles composing physical bodies. At the same time, however, he insists on the material character of these virtues (for his spirits are material), and rejects explanations that invoke immaterial attractive forces acting at a distance. This double polemical target explains why Borelli's language oscillates between teleology ("The movement of heavy bodies is intended to achieve a purpose") and necessitarianism (heavy bodies move "by blind necessity"). The article also explores the connection between Borelli's analysis of the spontaneous motions of physical bodies and his account of physiological processes, such as the respiration or the heartbeat, in the *De motu animalium* (1680).

* Center for the History and Philosophy and Science, Faculty of Philosophy, Theology and Religious Studies, Radboud University Nijmegen, The Netherlands, e-mail: carlarita.palmerino@ru.nl

LUCA TONETTI*

MALPIGHI'S EARLY VIEWS ON BRAIN ANATOMY:
A LOOK AT HIS UNPUBLISHED DRAWINGS AND NOTES

ABSTRACT – The publication of Malpighi's dissertation on the anatomy of the brain, *De cerebro*, in 1665, comes at a time of increased attention to brain studies. The structure of the optic nerve was one of the challenging questions Malpighi dealt with, and the numerous dissections of fish he had performed in Messina in 1663-1664 provided him with solid evidence for his innovative explanation of the anatomy and function of the brain and nerves. Malpighi's correspondence with Borelli and the examination of his unpublished notes kept at the Bologna University Library show the development of Malpighi's view on the anatomy of the brain, in particular the role that Borelli played in guiding and interpreting his anatomical observations.

* Alma Mater Studiorum University of Bologna, Department of Philosophy and Communication Studies (FILCOM), Via Zamboni, 38, 40126, Bologna, e-mail: tonetti.luca@gmail.com

¹ Although outdated, NEUBURGER, 1982 – which is the English translation of a work that appeared earlier in 1897 – still provides one of the most thorough introductions to the history of brain research in early modern medicine. On graphic representations of the brain in history, see now LANSKA, 2022. An overview of brain studies in the 1660s is provided in: BERTOLONI MELI, 2011, ch. 3. On Descartes: MESCHINI, 1998; AUCANTE, 2006; BALDASSARRI, 2021. On Willis: WRAGGE-MORLEY, 2018. On Steno: SCHERZ, 1968; KARDEL, MAQUET, 2013; ANDRAULT, 2018.

FEDERICA FAVINO *

BORELLI AND THE ANCIENT TRIREMES:
ANTIQUARIANISM AND POLITICAL COMMITMENT

ABSTRACT – As a protégée of Christina of Sweden, in the last years spent in Rome (1673-1679), Borelli happened to liven up the meetings of the former queen Royal Academy at Riario Palace by delivering speeches that his friend Michelangelo Ricci did not hesitate to call worthless ‘distractions.’ Scholarship, that mostly ignores these discourses, seems to agree with him. This paper will focus particularly on Borelli’s academic discourse on the ancient triremes – which he gave at Palazzo Riario on February the 5th, 1675 – an episode of a broader debate that then involved the most authoritative Roman antiquarians. In the light of the cultural scenario of late 17th century Rome and of Borelli’s biography, the discourse turns out to be nothing but a distraction: it propounds a clear epistemological stance even to antiquarians while suggesting a real contribution to the Messina Revolt against the Spanish rule, then still underway.

* Dipartimento di Storia Antropologia Religioni Arte e Spettacolo, Sapienza Università di Roma, Piazzale Aldo Moro 5, Rome, Italy, e-mail: federica.favino@uniroma.it. This research received funds by the European Union’s Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 799769. Unless otherwise stated, the translations are mine.

PART 2

CONTEXT AND RIVALRIES
IN BORELLI'S SCIENTIFIC JOURNEY

RENÉE RAPHAEL *

READING EXPERIMENT IN 17TH-CENTURY PISA:
BETWEEN UNIVERSITY AND ACADEMY

ABSTRACT – This contribution explores how readers associated with the University of Pisa and Accademia del Cimento approached texts that described experimental findings. It enriches previous scholarship on reading practices and literary technologies, which have tended to focus on the textual presentation of experimental findings and the reading practices associated with textual scholarship. Drawing on excerpts from the *Saggi* of the Accademia del Cimento and Borelli's *De motionibus naturalibus*, it considers, instead, the reading practices applied to texts that described experimental results. It demonstrates that while the Cimento modeled a reading practice centered on the replication of experimental trials, Borelli employed a more eclectic approach in writings commemorating his university teaching. These case studies are contextualized through comparisons with the reading practices employed by Borelli's predecessors at Pisa, members of the Royal Society, and the Society of Jesus.

* Department of History, University of California, Irvine, 200 Murray Krieger Hall, Irvine, CA 92697-3275, USA, e-mail: renee.raphael@uci.edu

NUNO CASTEL-BRANCO *

WHO WAS BORELLI RESPONDING TO?
NICOLAUS STENO IN *DE MOTU ANIMALIUM* (ROME, 1680-1681)

ABSTRACT – Giovanni Alfonso Borelli and Nicolaus Steno's theories of muscle contraction have often been considered to be at odds. This short essay, however, softens the antagonism between Steno and Borelli's muscle theories. It argues that Steno's work was more important to Borelli than previously acknowledged. It also claims that Borelli's disagreement with Steno was more nuanced than what Borelli assumes by associating their explanations to their different audiences and purposes in writing each book.

* Villa I Tatti, Via di Vincigliata, 26, 50135 Firenze, Italia, e-mail: nuno.cb@gmail.com

SIMON DUMAS PRIMBAULT*

A POSTHUMOUS RIVALRY:
ON BORELLI AND VIVIANI'S RELATIONSHIP
BETWEEN THE ACCADEMIA DEL CIMENTO
AND AN EIGHTEENTH-CENTURY CONTROVERSY

ABSTRACT – Between around 1656 and the late 1660s, Giovanni Alfonso Borelli and Vincenzo Viviani, self-proclaimed last disciple of Galileo, collaborated on a host of mathematical, physico-mathematical, and experimental problems, notably within the Accademia del Cimento. Their relationship, tensed at times, has long been characterised as a heated rivalry – the two men would have hated and continuously tried to outdo each other. Turning back to the archival sources – their correspondence and their disciples' correspondences – this contribution gathers, for the first time, all recorded events when merely embryonic priority disputes may have stained Viviani and Borelli's collaboration. Although these correspondences indeed show mild quarrels at times, they also prove that nothing ever became public or went further than personal complaints to third parties. To understand how Borelli and Viviani have become rivals, this contribution instead dives into eighteenth-century controversies between second-generation epigones who were waging war, through interposed publications, over the primacy of Galileo's heritage. The posthumously constructed rivalry later became entrenched and circulated down the centuries to late nineteenth- and twentieth-century historians.

* Laboratory for the History of Science and Technology, EPFL, Switzerland: EPFL/CDH/DHI/LHST, INN 116 (Bâtiment INN), Station 14, CH-1015 Lausanne, Switzerland, e-mail: simon.dumasprimbault@epfl.ch

GIULIA GIANNINI *

GIOVANNI ALFONSO BORELLI AND THE BOOKS OF OTHERS:
A CONTRIBUTION TO THE RECONSTRUCTION
OF BORELLI'S LIBRARY **

ABSTRACT – This work aims to supplement and expand the reconstruction of Giovanni Alfonso Borelli's library. By relying on the ex libris displayed on the title page of some volumes preserved at the *Biblioteca Nazionale Centrale* in Rome, 241 volumes originally belonging to Borelli have been identified. The list significantly integrates the one presented by Baldini in 1996 by not only roughly doubling the number of titles, but also incorporating areas of study that were left completely uncovered.

* Dipartimento di Studi Storici, Università degli Studi di Milano, Via Festa del Perdono, 7, Milano, Italia, e-mail: giulia.giannini1@unimi.it

** This work is part of a project that has received funding from the European Research Council (ERC) within the framework of the European Union's Horizon 2020 research and innovation program (TACITROOTS, PI: Giulia Giannini, Grant agreement No. 818098).

Direttore responsabile: prof. Stefano Carrai

Registrazione del Tribunale di Firenze n. 4026 del 6 novembre 1990

ISSN 0031-9414

FINITO DI STAMPARE
PER CONTO DI LEO S. OLSCHKI EDITORE
PRESSO ABC TIPOGRAFIA • CALENZANO (FI)
NEL MESE DI DICEMBRE 2022

TABLE OF CONTENTS

F. FAVINO, G. GIANNINI, *Borelli Reloaded: Contexts and Networks in 17th-Century Italy*

1. BORELLI'S SCHOLARLY WORK: MATHESIS, NATURAL PHILOSOPHY, AND ANTIQUARIANISM

V. DE RISI, *Euclid Upturned: Borelli on the Foundations of Geometry*

C.R. PALMERINO, *Gravity, Magnetism, Elasticity: the Role of Spontaneous Motion in Borelli's Mechanical Philosophy*

L. TONETTI, *Malpighi's Early Views on Brain Anatomy: a Look at His Unpublished Drawings and Notes*

F. FAVINO, *Borelli and the Ancient Triremes: Antiquarianism and Political Commitment*

2. CONTEXT AND RIVALRIES IN BORELLI'S SCIENTIFIC JOURNEY

R. RAPHAEL, *Reading Experiment in 17th-Century Pisa: between University and Academy*

N. CASTEL-BRANCO, *Who Was Borelli Responding to? Nicolaus Steno in *De motu animalium* (Rome, 1680-1681)*

S.D. PRIMBAULT, *A Posthumous Rivalry: on Borelli and Viviani's Relationship between the Accademia del Cimento and an Eighteenth-Century Controversy*

G. GIANNINI, *Giovanni Alfonso Borelli and the Books of Others: a Contribution to the Reconstruction of Borelli's Library*

Ricordo di Carlo Maccagni (1932-2022)

Ricordo di Raffaella Simili (1945-2022)

BOOK REVIEWS

M. MALPANGOTTO, *Theoricae novae planetarum Georgii Peurbachii dans l'histoire de l'astronomie* (O. Akopyan) – M. TORRINI, *Galileo nel tempo* (S. Ricciardo) – M. STORNI, *Maupertuis: Le philosophe, l'académicien, le polémiste* (P.D. Omodeo) – E. PROVERBIO, *Il contesto in cui Ruggero Giuseppe Bosovich maturò la decisione di trasferirsi in Francia nel 1773: Fatti e personaggi* (L. Guzzardi) – C.N. JOHNSON, *Darwin's "Historical Sketch."* *An Examination of the 'Preface' to the Origin of Species* (D. Ceccarelli) – S. BLUME, *Immunization: How Vaccines Became Controversial* (M. Capocci)