

## HPS&ST Note March 2017

### # Introduction

This HPS&ST monthly note is sent direct to about 7,300 individuals who directly or indirectly have expressed an interest in the contribution of history and philosophy of science to theoretical, curricular and pedagogical issues in science teaching, and/or interests in the promotion of innovative and more engaging and effective teaching of the history and philosophy of science. The note is sent on to different international and national HPS lists and science teaching lists. In one form or another it has been published for 20+ years.

The note seeks to serve the diverse international community of HPS&ST scholars and teachers by disseminating information about events and publications that connect to concerns of the HPS&ST community.

Contributions to the note (publications, conferences etc.) are welcome and should be sent direct to the editor: Michael R. Matthews, UNSW, [m.matthews@unsw.edu.au](mailto:m.matthews@unsw.edu.au).

### # 2017 IHPST Biennial Conference, Ankara July 4-7, 2017

*Looking back, looking ahead: Achievements and perspectives  
in HPS studies in science education*

**Dates:** July 4-7, 2017

**Venue:** Hacettepe Üniversitesi, Ankara, Turkey

**Chairs:** M. Fatih Ta ar (*Gazi Üniversitesi*) and Gültekin Çakmakçı (*Hacettepe Üniversitesi*)

**Registration:** Early Registration Deadline: 18 April 2017;

Registration Deadline: 23 June 2017

**Website:** <http://ihpst2017.wixsite.com/biennial-conference>



## Plenary Speakers

### **Gürol Irzik, Sabanci University, Turkey**

Dr. Irzik is a Professor at Sabanci University in the Faculty of Arts and Social Sciences. His career is marked by his interest in Philosophy of Science, Philosophy of Social Sciences, Social and Political Philosophy, and Science Education.

In addition to the numerous professional memberships he holds, Dr. Irzik was elected to the European Cultural Parliament in 2007 and to the Science Academy Association in Turkey in 2012.



### **Silke Ackermann, Oxford University, UK**

The Springer Lecturer for this conference is Dr. Ackermann, the Director of the Museum of the History of Science at Oxford University. Dr. Ackermann is the first female head of a museum at the University of Oxford. Prior to this position, she was the Curator of European and Islamic scientific instruments at the British Museum in London. Afterwards, Dr. Ackermann took up a professorship at the University of Applied Sciences Baltic College in Schwerin, Germany, where she was later appointed president.

Her research interests include the history of science of the Middle Ages and Renaissance and the Islamic World, scientific instruments (especially astrolabes), and knowledge transfer.



### **Zoubeida Dagher, University of Delaware, USA**

Dr. Dagher is professor of science education at the School of Education and a Faculty Fellow at the Center for Science, Ethics, and Public Policy, University of Delaware. She is currently serving as President of the International History and Philosophy of Science Teaching [IHPST] Group.

Her research interests include the nature of scientific methods and practices and representations of scientific epistemology in science curriculum and instruction.



## # Mario Bunge *Memoirs* and Festschrift

Mario Bunge, the Argentinian and Canadian philosopher and physicist was born on 21<sup>st</sup> September 1919. With continuing good fortune, he will celebrate his 98<sup>th</sup> birthday later this year and, if good fortune (along with good diet, exercise, a low-stress environment, and medication) continues, the expectation is that he will celebrate his 100<sup>th</sup> birthday in 2019. If so, he will join a very select group of scholars who were still publishing at 100 years.

Bunge's 500-page memoirs, *Between Two Worlds*, were published by Springer in 2016.

The book has been reviewed by Michael Matthews for *Science & Education* journal; Springer have made it freely available at:

<http://rdcu.be/n82t>

Extensive documentation of his life, work and publications are available at:

The Wikipedia site:

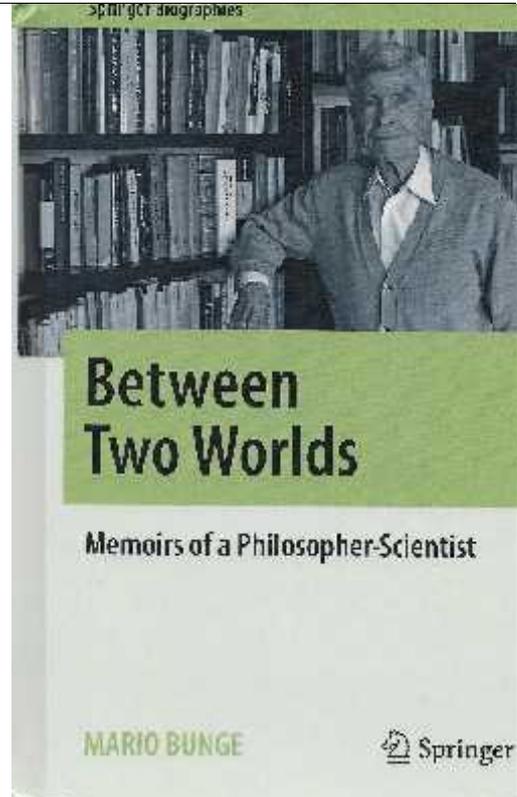
[https://en.wikipedia.org/wiki/Mario\\_Bunge](https://en.wikipedia.org/wiki/Mario_Bunge)

The McGill University site:

<http://www.mcgill.ca/philosophy/people/faculty/bunge>

A bibliography of Bunge's English-language publications is available at the IDTC website:

<http://www.idtc-iuhps.com/resources.html>



To celebrate Bunge's scholarly achievements across such a wide range disciplines and subject matters, and over a span of almost 80 years, Springer will publish a Bunge Centenary Festschrift to appear in mid-2019.

Bunge has published 80+ books and 400+ articles. His first publication, on Clerk Maxwell's physics, was in 1943; his most recent book was published this year, 2017 - *Doing Science in the Light of Philosophy* (World Scientific, Singapore). Many of his publications have been translated into the major European languages, Asian languages, and Russian. He has been honoured with a number of prestigious scholarly awards and appointments.

The breadth of Bunge's research and concerns can be seen by looking at just two years, 1977 and 2003, of his English bibliography (above).

[1977]

Bunge, M.: 1977a, *Treatise on Basic Philosophy. Vol.3, The Furniture of the World*, Reidel, Dordrecht.

- Bunge, M.: 1977b, 'The Interpretation of Heisenberg's Inequalities'. In H. Pfeiffer (ed.) *Denken und Umdenken: zu Werk und Wirkung von Werner Heisenberg*, Piper, Munich, pp.146-156.
- Bunge, M.: 1977c, 'The Philosophical Richness of Technology'. In F. Suppe & P.D. Asquith (eds.), *PSA 2*, pp.153-172.
- Bunge, M.: 1977d, 'Levels and Reduction', *American Journal of Physiology* 2, 75-82.
- Bunge, M.: 1977e, 'Emergence and the Mind', *Neuroscience* 2, 501-509.
- Bunge, M.: 1977f, 'States and events'. In William Hartnett (ed.), *Systems: Approaches, Theories and Applications*, Boston and Dordrecht: Reidel, pp. 71-95.
- Bunge, M.: 1977g, 'Quantum mechanics and measurement', *International Journal of Quantum Chemistry* 12, Suppl. 1: 1-13.
- Bunge, M.: 1977h, 'A Theory of Properties and Kinds', *International Journal of General Systems* 3: 183-190.

### [2003]

- Bunge M. 2003a. *Philosophical dictionary*. 2<sup>nd</sup> ed. Prometheus Books, Amherst, New York.
- Bunge, M.: 2003b, 'Velocity Operators and Time-Energy Relations in Relativistic Quantum Mechanics', *International Journal of Theoretical Physics* 42(1), 135-142.
- Bunge, M.: 2003c, 'Twenty-Five Centuries of Quantum Physics: From Pythagoras to Us, and from Subjectivism to Realism', *Science & Education* 12(5-6), 445-466.
- Bunge, M.: 2003d, 'Quantons are quaint but basic and real. *Science & Education*' 12: 587-597.
- Bunge, M.: 2003e, 'Philosophy of Science and Technology: A Personal Report'. In G. Fløistad (ed.) *Philosophy of Latin America*, Kluwer Academic Publishers, Dordrecht, pp.245-272.
- Bunge, M.: 2003f, *Emergence and Convergence*, University of Toronto Press, Toronto.
- Bunge, M.: 2003g, 'Interpretation and hypothesis in social studies'. In R. Boudon, M. Cherkaoui & R. Demeulenaere, (eds.), *The European Tradition in Qualitative Research*, vol. IV, London: Sage Publications, pp. 20-40.

Bunge believes that science can, and does, give us knowledge of the natural and social world; and that this knowledge is the only sound basis for social and political reform, and must inform considered ethical decision making. He is consequently a critic of social forces and academic movements that diminish the intellectual authority of reason and of science.

He is a champion of science, but not a cheerleader, in the sense of endorsing whatever might be the current scientific orthodoxy. Since his earliest writings, he is equally a critic of tendencies *within* science that he believes are philosophically naïve, inconsistent, incoherent, or inattentive to the big ontological and epistemological picture which is the goal of good science. Consequently, since the 1950s he has been a critic of the orthodox, positivist, non-realist, Copenhagen interpretation of Quantum Theory; since the 1970s, of Richard Dawkin's influential genetic theory; since the 1990s of rational-choice theory in economics and social psychology; and for many decades, a critic of the wide-spread and routine use of subjective Bayesianism in theory and hypothesis appraisal in both social and natural science.

Bunge is a systematist. He argues for the unity, not the disunity of both science and philosophy, and the necessity of doing both together – the title of his most recent book is *Doing Science in the Light of Philosophy* (2017). He is one of a small number of scholars able to make considered contributions to physics, social science, psychology, cognitive science, biology, history of science, social policy and philosophy. From graduate student

years, through to tenure decisions and beyond, there are enormous pressures on academics to specialise; and as the cliché has it, to learn more and more, about less and less. Bunge's deeply-informed cross-disciplinary competence stands in stark contrast to this all-powerful tendency; he is an exemplar of Liberal Education.

Since adolescence, Bunge has been a champion of the Enlightenment project, but again not a cheer-leader. In 1994 he wrote:

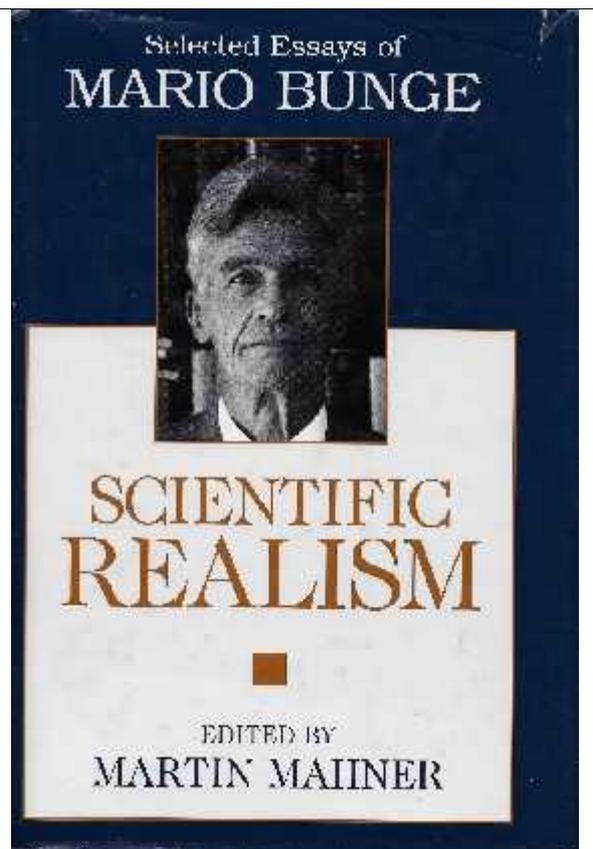
The Enlightenment gave us most of the basic values of contemporary civilized life, such as trust in reason, the passion of free inquiry, and egalitarianism. Of course, the Enlightenment did not do everything for us: no single social movement can do everything for posterity – there is no end to history. For instance, the Enlightenment did not foresee the abuses of industrialization, it failed to stress the need for peace, it exaggerated individualism, it extolled competition at the expense of cooperation, it did not go far enough in social reform, and it did not care much for women or for the underdeveloped peoples. However, the Enlightenment did perfect, praise, and diffuse the main conceptual and moral tools for advancing beyond itself. (Bunge 1994, p.40. In P. Kurtz & T.J. Madigan (eds.) *Challenges to the Enlightenment*, Prometheus Books).

In 2001, Martin Mahner edited a collection of 30 of Bunge's essays (Prometheus Books). Mahner's section heads for the book indicate something of the scope of Bunge's writings:

- # Metaphysics
- # Methodology and Philosophy of Science
- # Philosophy of Mathematics
- # Philosophy of Physics
- # Philosophy of Psychology
- # Philosophy of Social Science
- # Philosophy of Technology
- # Moral Philosophy
- # Social and Political Philosophy

To these subsequently can be added:

- # Criminology
- # Medical Philosophy
- # Philosophy of Biology
- # Implications for Education



Submissions for the Festschrift dealing with philosophical issues across the range of the above fields are invited. The should be original high-quality work which is informed by Bunge's own writings on the subject matter (see Wikipedia, McGill, and IDTC sites above). Needless to say, contributions can be critical of Bunge's positions; indeed these are

encouraged. From adolescent years, he has believed that constructive criticism - meaning clear, detailed, and informed - is the requirement for advancing both science and philosophy.

Contributions should be between 8-12,000 words. Reviewing will be a critical part of the project.

There will be both print and electronic versions of the book. Authors should follow the basic format and style guidelines for the Springer journal *Science & Education*. In brief, use the 'Harvard System' for citations, use footnotes, and bold headings. Full guidelines at: [http://www.springer.com/education+%26+language/science+education/journal/11191?detailsPage=pltc1\\_1060572](http://www.springer.com/education+%26+language/science+education/journal/11191?detailsPage=pltc1_1060572)

Individual chapters will be downloadable, and the whole work searchable by all net-search programmes.

**Timetable:**

1<sup>st</sup> May 2017, extended abstracts of 1,000 words submitted to editor. This allows early editorial input and better coordination of the project.

1<sup>st</sup> February 2018, manuscripts submitted.

March – June 2018, manuscripts reviewed.

1<sup>st</sup> September 2018, revised manuscripts submitted.

1<sup>st</sup> June 2019, book published.

More information about content, procedures and publication is available from the editor: Michael R. Matthews, UNSW, [m.matthews@unsw.edu.au](mailto:m.matthews@unsw.edu.au)  
Early notification of intention to submit would be helpful and appreciated.

**# Review of David Wootton's *The Invention of Science***

Springer have made freely available a review of:

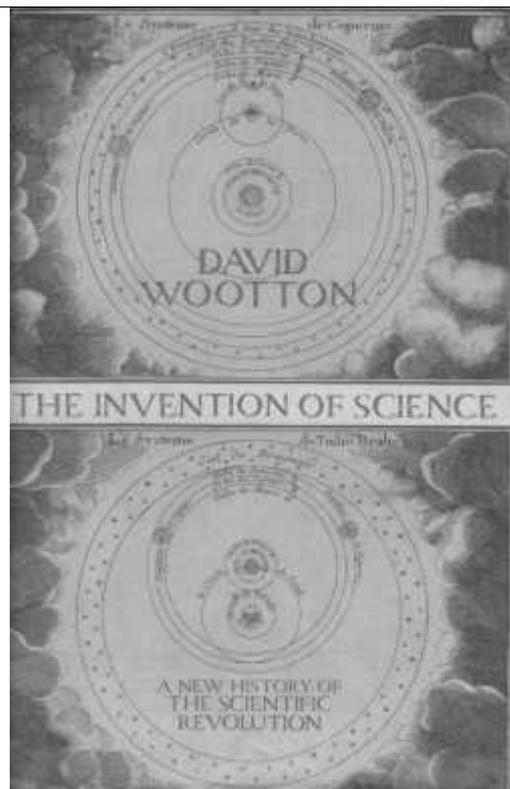
Wootton, D.: 2015, *The Invention of Science: A New History of the Scientific Revolution*, Penguin Random House, London.

<http://rdcu.be/qgfr>

The review appears in the current issue of *Science & Education*. It begins:

*This is an extensively documented, exhaustive study of the Scientific Revolution.*

*Commendably it combines deep historical study and detailed textual scholarship with engagement with core issues in contemporary philosophy of science.*



## # Royal Society Biographies

All content over 12 months old published in *Biographical Memoirs* - the collected obituaries of Royal Society Fellows - is now free to access. Each memoir is carefully researched, resulting in a unique biographical collection of lives and achievements.

More information can be found at:

<http://blogs.royalsociety.org/publishing/free-access-to-biographical-memoirs/>

## # Opinion Page: Bringing Science Down to Earth

Eric Scerri, Dept. of Chemistry, UCLA, USA

As scientists, we tend to tell our story through breakthroughs — paradigm shifts that shake the foundations of knowledge and remake everyone’s understanding of how the world works. It’s a tale of high-flying, singular brilliance, of Einsteins and Darwins, of pure genius.

Such a narrative of exceptionalism isn’t entirely wrong, but it’s wrong enough to help skew the way society thinks about science and to sow doubt about its findings. It puts us and our work too far out of the reach of too many people, and earns us epithets like “elitist” and “arrogant.”

The truth about science is much more prosaic. Detailed case studies on the history of chemistry and physics show that the role of genius in advancing those fields — and even the

role of rationality — is overstated. Rather than a hyper-intellectual, alien activity practiced by a remote priesthood, science is hit and miss, the ever-changing product of less-than-brilliant people, just like every other human activity.

Have you ever heard of John Nicholson, Anton Van den Broek, Richard Abegg, Charles Bury, John Main Smith, Edmund Stoner and Charles Janet? Don't worry, chances are many experts in the field of atomic structure — on which all of the above-named scientists worked — haven't heard of them either. After all, the feature linking these men is that, broadly speaking, they didn't always know what they were doing. In some cases, much of what they published turned out to be incorrect.

And yet each of them proposed one or two key ideas in their lifetimes that were picked up by others, modified and tested, and eventually led to major breakthroughs.

In the 1910s, the English mathematical physicist John Nicholson published a number of articles in which he proposed that several proto-elements (his term) existed in outer space and were the basis of our familiar terrestrial elements. Their presence in a number of celestial bodies, he claimed, enabled him for the first time to do successful calculations on the light reaching us from the Orion nebula and the solar corona.

At first his findings seemed to hold up, but it soon became clear that the calculations were incorrect or the result of numerological speculations. Nevertheless in the course of his work Nicholson also proposed that the angular momentum of electrons circulating around a nucleus should be “quantized,” meaning that it could only occur with specific definite values. This notion would set Danish physicist (and, ultimately, Nobel Prize winner) Niels Bohr off on his theory of the structure of the hydrogen atom. From that, quantum mechanics and all the technological applications based on it — including lasers and semiconductors — would follow.

Something similar happened with each of the other unknown scientists on my list. Their haphazard, often pedestrian work still provided keys to, for example, how the elements in the periodic table should be ordered (Van den Broek) and the “octet rule” that explains much of chemical bonding (Abegg).

When the whole of the history of atomic theory is understood, it's clear that the missing links turned up by these “regular people” scientists, and the details and even the dead ends they accumulated, are every bit as important as the insights of a star such as Bohr.

This view of science casts a dim light on priority disputes — the intense battles over who was or should be considered first to a discovery — which happens even among otherwise perfectly modest scientists. It helps explain why multiple researchers arrive at the same conclusion so often: Science is a cumulative, incremental, collective effort. Fierce competition among individuals is inevitable, and it may serve to develop better science in the short run, but overall, even heroic individual achievements are simply not as important as the ever-evolving whole.

In these doubting days, almost everyone at least accepts the utility of some science. Very few people so doubt the findings of aeronautics, for example, that they won't board an airplane. But a significant portion of the general public still finds science baffling. What is incomprehensible is regarded as questionable; what is puzzling can be dismissed. It doesn't

help that science represents our deepest and most reliable knowledge of the world and yet is also provisional — what we know is constantly being adjusted, tested.

In this too, however, science isn't unusual. Like life itself, it progresses by trial and error. It depends on humans simply trying things out, even if its practitioners don't always want to admit it.

Science is what we know to the best of our human abilities. Such as: Vaccinations don't cause autism; GMO corn is as safe as every other crop that has been genetically modified by other means for thousands of years; and Earth is warming past dangerous levels. The process that resulted in these findings isn't incomprehensible, remote or elitist. Even the rarefied field of atomic theory is built on human error and serendipity, on non-geniuses randomly groping around.

The better science communicates this notion, along with its fundamental ordinariness, the better its chances of being heard, understood and valued.

Eric Scerri's latest book is: *A Tale of Seven Scientists and a New Philosophy of Science*.

<http://www.ericscerri.com>

This opinion piece first appeared in *The Los Angeles Times* on February 20<sup>th</sup>, 2017.

*Previous Opinion Pieces* (at <http://www.idtc-iuhps.com/opinion.html>)

Robert Nola, University of Auckland, *Fake News in the Post-Truth World*, (February 2017)

Michael D. Higgins, President of Ireland, *The Need to Teach Philosophy in Schools*

(December 2016)

Philip A. Sullivan, University of Toronto, *What is wrong with Mathematics Teaching in Ontario?*

(July 2016)

Gregory Radick, Leeds University, *How Mendel's legacy holds back the teaching of science*

(June 2016).

Matthew Stanley, New York University, *Why Should Physicists Study History?*

*Invitation to Submit*

In order to make better educational use of the wide geographical and disciplinary reach of this HPS&ST Note, invitations are extended for readers to contribute opinion or position pieces or suggestions about any aspect of the past, present or future of HPS&ST studies.

Contributions can be sent direct to editor. Ideally, they might be pieces that are already on the web, in which case a few paragraphs introduction, with link to web site can be sent, or else the pieces will be put on the web with a link given in the Note.

They will be archived in the OPINION folder at the Inter-Divisional Teaching Commission web site (<http://www.idtc-iuhps.com/>).

The opinions do not, of course, represent any official position of the IDTC or the two divisions (DLMPS and DHST) it serves.

## # Recent HPS&ST Research Articles

- Bunge, M. (2016). Way Axiomatize? *Foundations of Science*, 1-13. doi:10.1007/s10699-016-9493-8 online first
- Barnes, R. M., Church, R. A., Draznin-Nagy, S. (2017) The Nature of the Arguments for Creationism, Intelligent Design, and Evolution. *Science & Education*, 1-21. doi: 10.1007/s11191-017-9875-5 online first
- Caamaño-Alegre, M. (2016). Drift Theory and Plate Tectonics: A Case of Embedding in Geology. *Foundations of Science*, 1-19. doi:10.1007/s10699-016-9505-8 online first
- Galili, I., Bar, V., & Brosh, Y. (2017). Teaching Weight-Gravity and Gravitation in Middle School: Testing a New Instructional Approach. *Science & Education*, 1-34. doi:10.1007/s11191-016-9865-z online first
- García-Carmona, A., Acevedo-Díaz, J. A. (2017) Understanding the Nature of Science Through a Critical and Reflective Analysis of the Controversy Between Pasteur and Liebig on Fermentation. *Science & Education*, 1-27. doi:10.1007/s11191-017-9876-4 online first
- Grove, M. (2017) Environmental complexity, life history, and encephalisation in human evolution. *Biology & Philosophy*, 1-26. doi:10.1007/s10539-017-9564-4 online first
- Herbert, S., Lynch, J. (2017) Classroom Animals Provide More Than Just Science Education. *Science & Education*, 1-17. doi:10.1007/s11191-017-9874-6 online first
- Oh, J.-Y., Jeon, E.C. (2016). Greenhouse Effects in Global Warming based on Analogical Reasoning. *Foundations of Science*, 1-21. doi: 0.1007/s10699-016-9501-z online first
- Müürsepp, P. (2016) Chemistry as a practical science (Edward Caldin Revisited). *Foundations of Chemistry*, 18(3), 213–223. doi:10.1007/s10698-016-9257-0
- Pradeu, T. (2017) Thirty years of Biology & Philosophy: philosophy of which biology? *Biology & Philosophy*, 32(2), 149-167. doi:10.1007/s10539-016-9558-7
- Rosenhouse, J. (2017). Thermodynamical Arguments Against Evolution, *Science & Education*, 1-23. doi:10.1007/s11191-017-9873-7 online first
- Smart, P. (2017) Extended Cognition and the Internet: A Review of Current Issues and Controversies. *Philosophy & Technology*, 1-34. doi:10.1007/s13347-016-0250-2 online first

## # Recent HPS&ST Related Books

Hobson, Art (2017) *Tales of the Quantum: Understanding Physics' Most Fundamental Theory*. New York, NY: Oxford University Press. ISBN: 9780190679637

“Everybody has heard that we live in a world made of atoms. But far more fundamentally, we live in a universe made of quanta. Many things are not made of atoms: light, radio waves, electric current, magnetic fields, Earth's gravitational field, not to mention exotica such as neutron stars, black holes, dark energy, and dark matter. But everything, including atoms, is made of highly unified or "coherent" bundles of energy called "quanta" that (like everything else) obey certain rules. In the case of the quantum, these rules are called "quantum physics." This is a book about quanta and their unexpected, some would say peculiar, behavior--tales, if you will, of the quantum.

“The quantum has developed the reputation of being capricious, bewildering, even impossible to understand. The peculiar habits of quanta are certainly not what we would have expected to find at the foundation of physical reality, but these habits are not necessarily bewildering and not at all impossible or paradoxical. This book explains those habits--the quantum rules--in

everyday language, without mathematics or unnecessary technicalities. While most popular books about quantum physics follow the topic's scientific history from 1900 to today, this book follows the phenomena: wave-particle duality, fundamental randomness, quantum states, superpositions (being in two places at once), entanglement, non-locality, Schrodinger's cat, and quantum jumps, and presents the history and the scientists only to the extent that they illuminate the phenomena.” (From the publisher)

More information at: <https://global.oup.com/academic/product/tales-of-the-quantum-9780190679637?q=hobson&lang=en&cc=us#>

Horst, Thomas, Lopes, M. dos Santos & Leitão, Henrique (eds.) (2017) *Renaissance Craftsmen and Humanistic Scholars — Circulation of Knowledge between Portugal and Germany*. Bern: Peter Lang. ISBN 978-3-631-68113-8

“The volume approaches the early modern knowledge transfer between Portugal and the German-speaking countries in an interdisciplinary way. It shows how knowledge travels with people, with artifacts, along commercial lines, and is created and transformed by the intervention of individuals from various educational and social strata.

The study of the relations between Portugal and the German-speaking countries in the 15th and 16th centuries is an intriguing topic that has attracted the interest of scholars for some decades. In recent years evidence accumulated has shown that there was still much to be known and even some large areas were still unexplored. In order to better grasp the nature of what was a complex historical phenomenon, an interdisciplinary approach to the topic turned out to be necessary by deepening the understanding of what is usually termed the circulation of knowledge. The present book shows how knowledge travels with people, with artifacts, along commercial lines, and is created and transformed by the intervention of individuals from various educational and social strata.” (From the publishers)

More information at: <http://www.lehmanns.ch/shop/geisteswissenschaften/38042890-9783631681138-renaissance-craftsmen-and-humanistic-scholars>

Wagner, Roi (2017). *Making and Breaking Mathematical Sense: Histories and Philosophies of Mathematical Practice*. Princeton, NJ: Princeton University Press

“In line with the emerging field of philosophy of mathematical practice, this book pushes the philosophy of mathematics away from questions about the reality and truth of mathematical entities and statements and toward a focus on what mathematicians actually do—and how that evolves and changes over time. How do new mathematical entities come to be? What internal, natural, cognitive, and social constraints shape mathematical cultures? How do mathematical signs form and reform their meanings? How can we model the cognitive processes at play in mathematical evolution? And how does mathematics tie together ideas, reality, and applications?

Roi Wagner uniquely combines philosophical, historical, and cognitive studies to paint a fully rounded image of mathematics not as an absolute ideal but as a human endeavor that takes shape in specific social and institutional contexts. The book builds on ancient, medieval, and modern case studies to confront philosophical reconstructions and cutting-edge cognitive theories. It focuses on the contingent semiotic and interpretive dimensions of mathematical practice, rather than on mathematics' claim to universal or fundamental truths, in order to explore not only what mathematics is, but also what it could be. Along the way, Wagner challenges conventional views that mathematical signs represent fixed, ideal entities; that mathematical cognition is a rigid transfer of inferences between formal domains; and that mathematics' exceptional consensus is due to the subject's underlying reality.

The result is a revisionist account of mathematical philosophy that will interest mathematicians, philosophers, and historians of science alike. (from the publisher)

More information at: <http://press.princeton.edu/titles/10909.html>

Wittje, Roland (2016). *The Age of Electroacoustics: Transforming Science and Sound*. Cambridge, MA: The MIT Press

“At the end of the nineteenth century, acoustics was a science of musical sounds; the musically trained ear was the ultimate reference. Just a few decades into the twentieth century, acoustics had undergone a transformation from a scientific field based on the understanding of classical music to one guided by electrical engineering, with industrial and military applications. In this book, Roland Wittje traces this transition, from the late nineteenth-century work of Hermann Helmholtz to the militarized research of World War I and media technology in the 1930s.

“Wittje shows that physics in the early twentieth century was not only about relativity and atomic structure but encompassed a range of experimental, applied, and industrial research fields. The emergence of technical acoustics and electroacoustics illustrates a scientific field at the intersection of science and technology. Wittje starts with Helmholtz’s and Rayleigh’s work and its intersection with telegraphy and early wireless, and continues with the industrialization of acoustics during World War I, when sound measurement was automated and electrical engineering and radio took over the concept of noise. Researchers no longer appealed to the musically trained ear to understand sound but to the thinking and practices of electrical engineering. Finally, Wittje covers the demilitarization of acoustics during the Weimar Republic and its remilitarization at the beginning of the Third Reich. He shows how technical acoustics fit well with the Nazi dismissal of pure science, representing everything that “German Physics” under National Socialism should be: experimental, applied, and relevant to the military.” (From the Publisher)

More information at: <https://mitpress.mit.edu/books/age-electroacoustics>

von Plato, Jan (2017). *The Great Formal Machinery Works: Theories of Deduction and Computation at the Origins of the Digital Age*. Princeton, NJ: Princeton University Press. ISBN: 9781400885039

“The information age owes its existence to a little-known but crucial development, the theoretical study of logic and the foundations of mathematics. The Great Formal Machinery Works draws on original sources and rare archival materials to trace the history of the theories of deduction and computation that laid the logical foundations for the digital revolution.

“Jan von Plato examines the contributions of figures such as Aristotle; the nineteenth-century German polymath Hermann Grassmann; George Boole, whose Boolean logic would prove essential to programming languages and computing; Ernst Schröder, best known for his work on algebraic logic; and Giuseppe Peano, cofounder of mathematical logic. Von Plato shows how the idea of a formal proof in mathematics emerged gradually in the second half of the nineteenth century, hand in hand with the notion of a formal process of computation. A turning point was reached by 1930, when Kurt Gödel conceived his celebrated incompleteness theorems. They were an enormous boost to the study of formal languages and computability, which were brought to perfection by the end of the 1930s with precise theories of formal languages and formal deduction and parallel theories of algorithmic computability. Von Plato describes how the first theoretical ideas of a computer soon emerged in the work of Alan Turing in 1936 and John von Neumann some years later.

“Shedding new light on this crucial chapter in the history of science, *The Great Formal Machinery Works* is essential reading for students and researchers in logic, mathematics, and computer science. (From the Publisher)

More information at: <http://press.princeton.edu/titles/10979.html>

## # Coming HPS&ST Related Conferences

March 31-1, 2017, Scientific Knowledge Under Pluralism, Center for Philosophy of Science  
University of Pittsburgh

Inquiries to: Haixin Dang ([had27@pitt.edu](mailto:had27@pitt.edu)).

April 6-7, 2017, Beyond the Academy. The Practice of Mathematics from the Renaissance to the Nineteenth Century' Priory Street Centre, York, UK.

Details at: <http://www.bshm.ac.uk/events/beyond-academy-practice-mathematics-renaissance-nineteenth-century>

April 19-21, 2017, National Congress of the Société Française d'Histoire des Sciences et des Techniques (SFHST), Strasbourg, France.

Details at: <https://sfhststras2017.sciencesconf.org/>

April 19-22, 2017, sixth annual Scientiae conference, Padua, Italy.

Contact info: Vittoria Feola [scientiaepadua@gmail.com](mailto:scientiaepadua@gmail.com)

April 20-21, 2017, Nordic Network for Philosophy of Science, annual conference, Copenhagen, Denmark

Details at: <https://nnpscience.wordpress.com/>

April 22-15, NARST Annual Conference, San Antonio, USA

Details at: <http://www.narst.org/>

May 18-20, 2017, The 28<sup>th</sup> Baltic Conference on the History of Science, Tartu, Estonia

Details from: [tarmo.kiik@gmail.com](mailto:tarmo.kiik@gmail.com) and : [www.bahps.org](http://www.bahps.org)

May 18-20, 2017, Humours, mixtures and corpuscles. a medical path to corpuscularism in the seventeenth century, Pisa, Italy.

Inquiries to: Dr Fabrizio Bigotti ([f.bigotti@exeter.ac.uk](mailto:f.bigotti@exeter.ac.uk))

May 18-21, 2017, 7th Annual Values in Medicine, Science, and Technology Conference, University of Texas, Dallas

Details at: <http://www.utdallas.edu/c4v/2017-cfp/>

May 24-27, 2017, Narrating Science: The Power of Stories in the 21<sup>st</sup> Century, Toronto, University of Guelph, Canada.

Inquiries to Susan Gaines ([smgaines@uni-bremen.de](mailto:smgaines@uni-bremen.de))

May 27-29, 2017. Canadian Society for the History and Philosophy of Science Annual Meeting, Toronto, Canada

Details at: <http://www.yorku.ca/cshps1/meeting.html>

June 8-10, 2017, XVIII UNIVERSEUM European Academic Heritage Network Meeting, University of Belgrade, Serbia

Details at: <http://universeum.it/meetings.html>

June 19-20, 2017, Fears and Angers: Historical and Contemporary Perspectives, Arts Two Building, Mile End Campus, Queen Mary University of London

Details at: <https://projects.history.qmul.ac.uk/emotions/events/fears-and-angers-historical-and-contemporary-perspectives/>

June 22-25, 2017, 49th Annual Meeting of Cheiron: The International Society for the History of Behavioral and Social Sciences

Details at: <https://www.uakron.edu/cheiron/annual-meeting/2017.dot>

- June 28-30, 2017, 22nd EURAS Annual Standardisation Conference - Digitalisation: Challenge and Opportunity for Standardisation, Berlin, Germany  
Contact: Kai Jakobs at [Kai.Jakobs@cs.rwth-aachen.de](mailto:Kai.Jakobs@cs.rwth-aachen.de)
- June 29-July 1, 2017, 'New Perspectives on Science and Religion in Society', Newman University, UK.  
Details at: <http://scienceligionsspectrum.org/engage/events/new-perspectives-on-science-and-religion-in-society/>
- July 4-7, 2017, 14<sup>th</sup> IHPST International Biennial Conference, Ankara, Turkey.  
Details at: <http://ihpst2017.wixsite.com/biennial-conference>
- July 5-8, 2017, 2nd International Workshop in the Framework of "Hermoupolis Seminars" "Beyond Nature in Science and Literature", Syros.  
Details at: <http://coscilit.eap.gr/>
- July 6-7, 2017, Historical Perspectives on Essentialisation and Biologisation of Gender Interdisciplinary Symposium of the Working Group of Women's and Gender History (AKHFG) at the Ruhr-Universität Bochum, Germany  
Organizers: Dr. Muriel González Athenas, Dr. Falko Schnicke and Prof. Dr. Maren Lorenz, [muriel.gonzalez@rub.de](mailto:muriel.gonzalez@rub.de) [schnicke@ghil.ac.uk](mailto:schnicke@ghil.ac.uk) [maren.lorenz@rub.de](mailto:maren.lorenz@rub.de)
- July 6-9, 2017, British Society for the History of Science annual meeting, York, UK  
Details at: <http://www.bsbs.org.uk/conferences/annual-conference>
- July 16-21, 2017, International Society for the History, Philosophy, and Social Studies of Biology (ISHPSSB) 2017 Meeting, São Paulo, Brazil.  
Details at: <http://www.ishpssb.org/announcements/148-ishpssb-2017-meeting>
- July 23-29, 2017, 25<sup>th</sup> International Congress of History of Science, and Technology (ICHST), Rio de Janeiro, Brazil.  
Details at: <http://www.ichst2017.sbh.org.br/site/capa>
- August 5-7, 2017, Quo Vadis Selective Scientific Realism?, Durham University, UK  
Details at: <http://community.dur.ac.uk/evaluating.realism/events.html>
- August 24-26, 2017, European Workshops on Philosophical Practice, Mazury, Poland  
Details at: <http://mazury2017.pl/>
- August 29-2, 2017, 11th International Conference on the History of Chemistry (11th ICHC) Trondheim, Norway  
Details at: <http://www.ntnu.edu/11ichc>
- September 6-9, 2017, European Philosophy of Science Association (EPSA17), UK, University of Exeter.  
Details: <http://www.philsci.eu/epsa17>
- September 7-10, 2017, 8th Tensions of Europe Conference Athens, Greece.  
Details at: <http://8toe2017.phs.uoa.gr/>
- September 12 – 14, 2017, Thinking about Space and Time: 100 Years of Applying and Interpreting General Relativity, Bern, Switzerland.  
Details at: [http://www.philosophie.unibe.ch/news/spacetime2017/index\\_eng.html](http://www.philosophie.unibe.ch/news/spacetime2017/index_eng.html)
- September 13-16, 2017, British Society for the History of Medicine Congress, Surgeons' Hall, Edinburgh, UK.  
Details at: <http://bshh.org.uk/>
- September 14-15, 2017, Joseph Banks: Science, Culture and Exploration, London  
Details at: <http://www.rmg.co.uk/work-services/what-we-do/learning-partnerships/joseph-banks-science-culture-and-remaking-indo-pacific-world>
- September 20-22, 2017, The Sixth Conference of the European Network for the Philosophy of the Social Sciences (ENPOSS), Kraków, Poland

Details at: <http://uekwww.uek.krakow.pl/pl/uczelnia/wydzialy/wydzial-gospodarki-i-administracji-publicznej/wydzial/katedry/katedra-filozofii/enposs-2017.html>

September 22-24, 2017, Contemplating Science, Medicine, and Technology: Past and Present Challenges, University of Münster, Germany

Inquiries to: Philipp Osten [p.osten@uke.de](mailto:p.osten@uke.de)

September 28-30, 2017, The Making of the Humanities VI, University of Oxford, Somerville College, UK

Details at: <http://www.historyofhumanities.org/>

October 13-15, 2017, Workshop for the History of Environment, Agriculture, Technology & Science (WHEATS), University at Albany, History Department

Details at: <https://wheats2017.wordpress.com/>

October 26-27, 2017, Making sense of data in the sciences, Leibniz University, Hannover, Germany

Details at: <https://dataintensivescience.wordpress.com/>

November, 17-18, 2017, 40th History of Technology Conference: Colors in Technology – Technology of Colors, Klostersgut Paradies, Schlatt, Switzerland

Contact: Franziska Eggimann at: [franziska.eggimann@georgfischer.com](mailto:franziska.eggimann@georgfischer.com)

December 7–9, 2017, Genealogies of Knowledge I: Translating Political and Scientific Thought across Time and Space, Manchester, UK

Details at: <http://genealogiesofknowledge.net/2016/11/23/genealogies-knowledge-i-translating-political-scientific-thought-across-time-space/>

March 10-13, 2018, NARST annual conference, Atlanta, USA

Details at: <http://www.narst.org/>

March 30-April 1, 2018, 13<sup>th</sup> Maghrebrian Colloquium on the History of Arabic Mathematics, Tunis City

Information from Mahdi Abdeljaouad [mahdi.abdeljaouad@gmail.com](mailto:mahdi.abdeljaouad@gmail.com)

June 16-26, 2018, The 6th UNILOG - World Congress and School on Universal Logic

Details at: <http://www.uni-log.org>

June 30 – July 2, 2018, 7<sup>th</sup> SPSP Congress, Ghent University, Belgium

Details, Erik Weber, [Erik.Weber@UGent.be](mailto:Erik.Weber@UGent.be)

November 21-23, 2018, Fourth Asian HPS&ST Conference, National Dong Hwa University, Hualien, Taiwan.

Details from: Dr Chia-Ling Chiang, [clchiang@mail.ndhu.edu.tw](mailto:clchiang@mail.ndhu.edu.tw)