

HPS&ST Newsletter
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Introduction

The HPS&ST Newsletter is sent monthly to about 10,300 emails of individuals who directly or indirectly have 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, engaging and effective teaching of the history and philosophy of science. The newsletter is sent on to different international and national HPS lists and international and national science teaching lists. In print or electronic form, it has been published for 40+ years.

The Newsletter, along with RESOURCES, OBITUARIES, OPINION PIECES and more, are lodged at the website: [HERE](#)

The newsletter 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 (publications, conferences, Opinion Piece, etc.) are welcome and should be sent direct to the editor: Michael R. Matthews, UNSW, m.matthews@unsw.edu.au .

Conference: *Mathematics, Language, and the Moral Sense of Nature*, Maynooth University, 30 August - 1 September 2023.

Drawing upon the Maynooth alumnus and Irish philosopher of science [Ernan McMullin](#)'s idea of consonance (1981), this multi-disciplinary conference explores the interplay between mathematized logic, language, morality, and understandings of nature in premodern and modern eras from Western and Global perspectives.

Acknowledging, though independent from, McMullin's theological imperative, the conference - *Consonances* - has presentations from historians of mathematics, science, philosophy, and theology which 'retain the autonomy of each discipline [...] in ways which do not fall into conflict' (P.M.J. Hess & P.L. Allen, *Catholicism and Science*, Wesport, CT: Greenwood Press 2008, pp.134-137).



In addition to a tour of the [Russell Library](#), and an exhibition of McMullin's Maynooth bequest, this two-and-a-half-day conference will have 18 multi-disciplinary presentations. Confirmed Invited Speakers include: [Professor Robert Goulding](#) (University of Notre Dame), [Professor Sophie Roux](#) (École Normale Supérieure, Paris), [Dr David Albertson](#) (University of Southern California), [Dr Richard Oosterhoff](#) (The University of Edinburgh) and [Dr. Xiaona Wang](#) (University of Warwick).



McMullin, Ernan. 'How Should Cosmology Relate to Theology?' In Arthur Peacocke, ed., *The Sciences and Theology in the Twentieth Century*, Notre Dame, IN: University of Notre Dame Press, 1981, pp. 17-57.

Allen, Paul L., *Ernan McMullin and Critical Realism in the Science-Theology Dialogue*, Aldershot: Ashgate, 2006).

For further details on the conference, including sponsors, accommodation and registration (which closes on June 30th), please visit the [conference website](#).

Participants may also be interested in attending the 6th Irish History of Mathematics (IHoM6) Conference. Please visit the [conference website](#) for further details on this conference, which runs at Maynooth University on the 30th August before Consonances conference commences. Registration is free but required.

Any queries for the Consonances conference should be sent to the conference email address (consonancesconference@gmail.com). Susan Gottlöber, Ciarán Mac an Bhaird, and Kevin Tracey (Consonances Conference Organisers)

Karl Popper's Philosophy and Influence

[The virtual event below was held on June 4 this year. Details and links are provided as the event was recorded and readers might wish to contact organisers or follow-up individual links.]

Part II of the 2023 transcontinental Meet-and-Greet, celebrating the philosophy of Karl Popper. It will take place on Sunday, June 4th starting at 10:00am BST (London, UK, time zone), the first Sunday of June. It is a free event, and everyone is welcome. *The entire event will be recorded.*

The latest version of the program can be found [HERE](#).

- 10am**: Welcome and general introductions
- 11am**: Remembering and celebrating [Ian Jarvie \(1937-2023\)](#) who died on Tuesday May 16 2023.
- noon**: A conversation with Alex Naraniecki about how he decided to do a Ph.D on Popper's philosophy
- 1pm**: Remembering and celebrating [Joseph Agassi \(1927-2023\)](#), together with his friends, colleagues, students and other people touched by him and his writings.
- 3pm**: A conversation with Denis & Ray Noble about their latest book, [Understanding Living Systems](#) that will become available in July 2023. It is [a critique of neo-Darwinism and gene-centric reasoning](#). The Noble brothers will also comment on Popper's Medawar's speech and his so-called active Darwinism. The conversation is hosted by Sadia Naem.
- 6pm**: A conversation with Jeremy Shearmur about his book, [The Political Thought of Karl Popper](#), hosted by Luc Castelein (admin of the [Karl Popper Facebook page](#)).
- 8pm**: Remembering [Frank Lovell](#) and [Craig J. Bolton](#), together with their friends from the [Critical Rationalism Facebook group](#).
- 9pm**: A conversation about [Sheldon Richmond's](#) latest latest book, [Restoring our Humanity: Six Essays](#), hosted by [Elyse Hargreaves](#). Sheldon did his graduate work under the supervision of Joseph Agassi.

The event is organized by the friends of [ourkarlpopper.net](#), and the latest details can be found on its website in the drop down menu in the right-hand corner. We have a [Facebook page](#) as

well. If you would like to join the associated Google group, *Karl Popper with Everyone*, click [HERE](#) and submit a request to join.

On behalf of the organizing team (Rafe Champion, Luc Castelein, Elyse Hargreaves, Margaretha Hendrickx)

<https://ourkarlpopper.net/2023-transcontinental-meet-n-greet-part-2/>

2023 IUHPST Essay Prizes

The 2023 winner of the IUHPST Essay Prize in History and Philosophy of Science is **Ahmad Elabbar** from Cambridge University for his essay "The curatorial view of assessment and the ethics of scientific advice: Beyond decisional autonomy towards distributive epistemic justice".

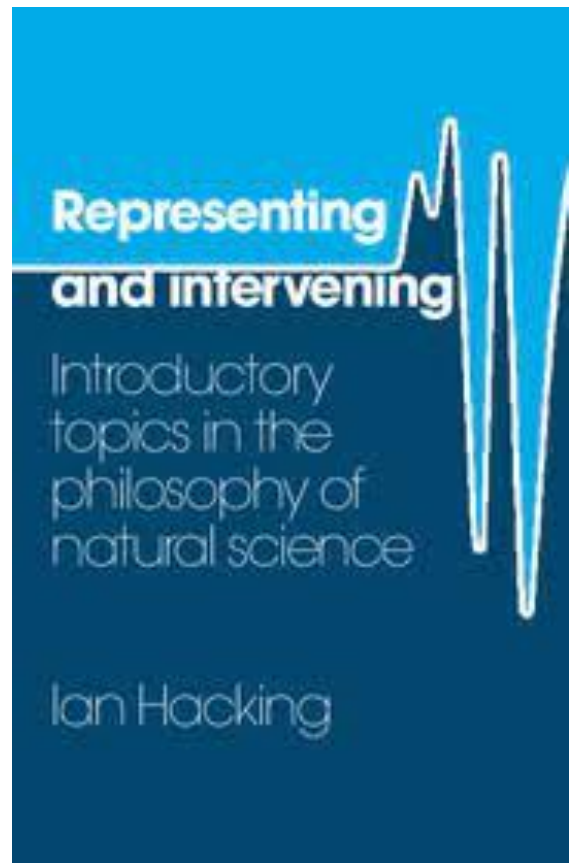
The runner-up prize has gone to **Karoliina Pulkkinen** of the University of Helsinki for her essay "Beyond democratic legitimacy of value-judgments in science: a closer look at science in the early Soviet Union".

The full prize announcement, along with links to files of each essay, is available [HERE](#).

Vale: Ian Hacking (1936-2023)

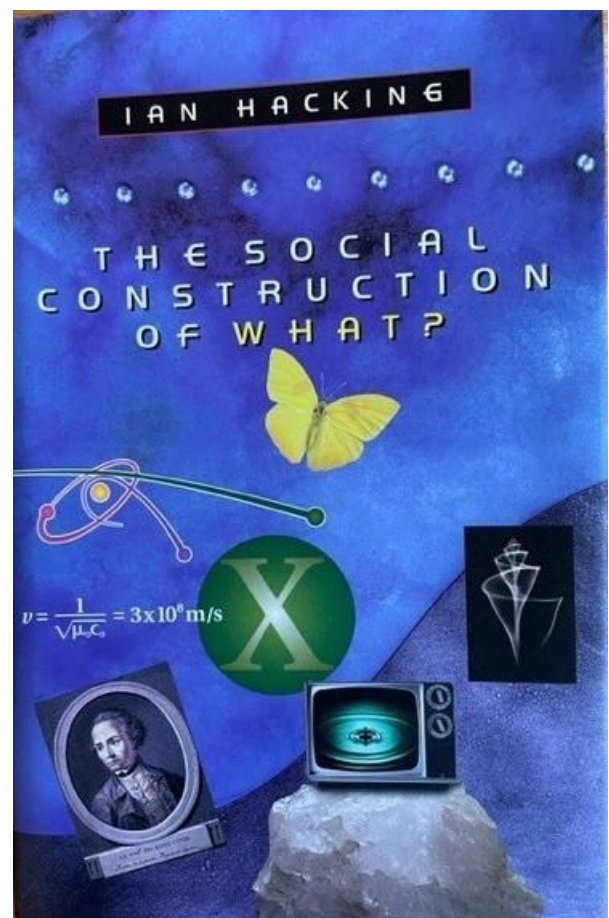
Ian Hacking, an outstanding Canadian philosopher of science and cross-disciplinary scholar, died on 10 May age 87 years.

He is internationally known for his work across a range of disciplines, including philosophy of science, the philosophy of probability, philosophy of math, philosophy of language, philosophy of mental illness, social construction, and the philosophy of history, among others.



His books include *The Logic of Statistical Inference* (1965), *The Emergence of Probability* (1975), *Why Does Language Matter to Philosophy?* (1975), *Representing and Intervening* (1983), *The Taming of Chance* (1990), *Rewriting the Soul: Multiple Personality and the Sciences of Memory* (1995), *Mad Travelers: Reflections on the Reality of Transient Mental Illnesses* (1998), *The Social Construction of What?* (1999), *Historical Ontology* (2002), and *Why is there Philosophy of Mathematics at All?* (2014).

Cheryl Misak, a philosophy colleague at the University of Toronto, noted: 'Ian Hacking was a one-person interdisciplinary department all by himself'.



Hacking wrote little on education. He did not need to. His scholarly life embodied what liberal education is about: Curiosity, seriousness, broad

horizons, rejection of silo-life or academic specialism, and engagement in public issues that can be illuminated by philosophy. Scholars who are doing all of this need not write about it; their example suffices.

One public educational issue to which Hacking contributed was the debate over teaching evolution in schools.

In the October 8, 2007, issue of *The Nation*, he reviewed five books relevant to the creationism/evolution controversy: Philip Kitcher's *Living with Darwin: Evolution, Design, and the Future of Faith*, Michael Lienesch's *In the Beginning: Fundamentalism, the Scopes Trial, and the Making of the Antievolution Movement*, Michael Behe's *The Edge of Evolution: The Search for the Limits of Darwinism*, Ronald L Numbers's *The Creationists: From Scientific Creationism to Intelligent Design*, and *A Religious Orgy in Tennessee: A Reporter's Account of the Scopes Monkey Trial*, a collection of HL Mencken's contemporary reportage.

Glenn Branch of the National Centre for Science Education commented on Hacking's review, writing that: 'Hacking began by looking on the bright side: "The anti-Darwin movement has racked up one astounding achievement. It has made a significant proportion of American parents care about what their children are taught in school". However, he subsequently observed, "The debate about who decides what gets taught is fascinating, albeit excruciating for those who have to defend the schools against bunkum." With Kitcher, he prefers to classify creationist bunkum not as bad science or pseudoscience, but as dead science — or, borrowing a term from the philosopher of science Imre Lakatos, "degenerate science"'.

There has been plentiful philosophical energy expended on the differences between productive science, unproductive science, degenerate science and pseudoscience. In many countries, significant educational, policy and economic consequences follow from one or other accounts. A strong position is that pseudosciences were simply never science despite having some features of science. They had some necessary features, but not sufficient to warrant being scientific.

One of his few direct educational engagements was a lecture to Portuguese science teachers under the auspices of the Ministry of Education (chap. 7 of *Social Construction of What?* He chose dolomite rocks as the subject of his lecture, saying 'it that it was old-fashioned because it explained some traditional philosophy of science and also introduced contemporary science studies'. Nothing fancy, but what science teachers appreciate hearing about.

Much of Hacking's *oeuvre* can shed light on important theoretical debates in science education, most obviously debates about Nature of Science (NOS), Science and Culture, and Constructivism.

For many, his delimited entity realism, so well captured in his comment on the existence of electrons manipulated in cathode tubes – 'if you can spray them about, they are real' - is the entry price for being scientific. Others want a more robust realism that extends to affirmation of truth claims made within scientific theories. The confirmed existence, typically by experiment, of the postulated entities bears on the truth of the theory and metaphysical framework that led to their postulation with their specified properties. These more robust realists see a more intimate connection between ontology and epistemology than bare entity realism requires.

An informative *NYT* obituary for Hacking can be read [HERE](#). A University of Toronto Philosophy Department Memoriam can be read [HERE](#). A *Daily Nous* obituary can be read [HERE](#).

History, Philosophy and Biology Teaching Lab (LEFHBio) Seminar Cycle

LEFHBio is associated with the Institute of Biology/ Federal University of Bahia and the National Institute of Science and Technology in Interdisciplinary and Transdisciplinary Studies in Ecology and Evolution (INCT IN-TREE), Brazil. Since 2022, it began organizing its seminar cycle with invited speakers coming both from academic and a diversity of other environments.

DATE: June 13

TITLE:

Epistemically potent environments for complex knowings

SPEAKERS:

Ana Teixeira de Melo (Centre for Social Studies, University of Coimbra, Portugal) & Leo Caves (Independent researcher)

Language: English

ABSTRACT: We discuss the notion of epistemically potent environments and their role in generating complex knowings. We will review different ways in which environments can be approached regarding the general organisation of interventions targeting complex knowings, from a 4-E cognitive perspective (Embodied, Enactive, Embedded and Extended, as well as Affective).

We discuss the implications for designing and managing interventions in science as a context of knowledge production and, in particular, Inter- and Transdisciplinarity. We emphasise the role of abductive processes - the processes of discovery - through action-research practices.

WHEN?

June 13th 2023, 10:00 AM BRT

(For conversion, use [HERE](#) choosing Salvador, Bahia - Brazil)

WHERE:

Remote event, Zoom

Short URL: [HERE](#)

Long URL: [HERE](#)

Previous events of the Seminar Cycle of the Teaching, Philosophy and History of Biology Laboratory (LEFHBio) are available in the LEFHBio channel on You Tube:

Kostas Kampourakis, Students' "teleological misconceptions" in evolution education: why the underlying design stance, not teleology per se, is the problem: [HERE](#)

Adela Molina, Matriz compreensiva da educação científica com uma abordagem intercultural [HERE](#)

Maël Montévil, How should we think scientifically about biological objects? [HERE](#)

Celso Sánchez, A pesquisa em educação ambiental e a perspectiva comunitarista na pesquisa em educação [HERE](#)

Luiza Machado e Ahypunã Gwa Tawato, Povo Maraguá: Vida e Luta [HERE](#)

Eduardo Solari, Anna Simão, Maria Bandeira, Insurgências em prol da Autogestão Comunitária [HERE](#)

Antoine Dussault, On the possibility of generalized selected effects ecological functions [HERE](#)

Fábio Nunes, Projeto de Conservação do Periquito Cara-Suja [HERE](#)

André Junqueira, Ecologia Histórica da Amazônia [HERE](#)

Sabina Leonelli, Globalizing plant knowledge beyond extractive epistemologies [HERE](#)

Hilton Japyassu, Cognição estendida: fechamento organizacional e ecologia da individualidade [HERE](#)

Further information:

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HPS&ST in Latin America

5th International Conference on History, Philosophy and Science Teaching in Latin America (IHPST-LA 2023)

History, Philosophy, Sociology and Science Teaching in times of Scientific Denial

The IHPST-LA will be held in Porto Alegre (Brazil) from August 9th to 11th, 2023. It will gather researchers from all Latin America to discuss HPS&ST and its contemporary challenges. More information is available [HERE](#).

The event will take place at the headquarters of the Institute of Physics of the Federal University of Rio Grande do Sul, in Porto Alegre. Paper submissions will be accepted until April 2nd, 2023. registration, submission rules, dates, are available on the event website: [HERE](#)

The IHPST-LA 2023 event will provide space for dialogue, communication, meetings, in which we can overcome barriers and difficulties to further strengthen our research community. In difficult times like the ones we are experiencing,

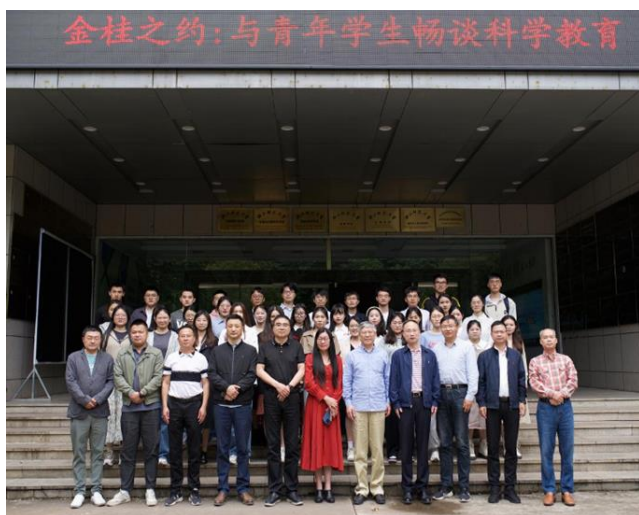
consolidating and advancing the promotion of research and research and teaching institutions is a powerful way of contributing to building a better and fairer world.

Do you have any contributions about HPS&ST in Latin America? If you have any information about events, publications, research groups, books about HPS&ST in Latin American and want to submit a brief note to be published in the HPS&ST Newsletter, please contact first Nathan Lima [here](#) or secondly Michael Matthews [here](#).

HPS&ST in Asia

China

On April 19, 2023, Professor Huang Xiao, the director of the Science Education Research Center at Zhejiang Normal University, was invited to host the online event "Making Additions to Science Education and Cultivating Students' Innovative Thinking". This event was jointly participated by Professor Lin Changchun, the chairman of the Science Teacher Education Committee of the China Association of Youth Science and Technology Educators, Professor Xing Hongjun, a doctoral supervisor at the Capital Normal University School of Education, and Principal Xie Yusheng, a special-grade teacher at Jinhua Experimental School for Foreign Languages.



On May 24-25, 2023, the *The Jin Gui Talk: In-depth Discussions on Science Education with Young Students* event, sponsored by the Physics Education and Popularization Committee of China

Youth Science and Technology Education Workers Association and the School of Education of Zhejiang Normal University, was held at Zhejiang Normal University. The event also included the "Jin Gui Micro-Forum: Conversations on Science Education". Students and teachers from the Science Education Department of Guangxi Normal University and the Science and Technology Education Department of Zhejiang Normal University participated in this event.

During the event, teachers and students had in-depth exchanges about project-based learning, critical thinking, the nature of science, social science issues, and the history and philosophy of science. In the discussion on the theme of "An Empirical Study on Promoting Junior High School Student's Critical Thinking Through HPS Teaching", expert judges raised questions such as "How to embody the philosophy and sociology of science in teaching?" and "How to help students understand the spirit of scientists in the history of science?"

Students presented approaches to teaching the "Law of Conservation of Mass" as an example; and proposed the idea of understanding the philosophy of science through specific episodes and developments in history of science.

In order to experience the different approaches to science education in Guangxi and Zhejiang, to better promote science education practices, and to innovate the institutional mechanisms of science education research, teachers and students engaged in presentations, exchanges, and discussions on diverse topics such as exploration practices, STEM education, technological applications in teaching innovation, science and technology competitions, and biodiversity museums. These activities aimed to assist young teachers in promoting the scientific frontier, producing science education resources, and implementing scientific concepts and methods. Based on the seminar, teachers and students visited and experienced digital information experimental equipment, observed exemplary teacher's lesson, and enriched themselves on the stage of vivid practice facing junior high school students.

Japan

On February 2, 2023, the Ministry of Education, Culture, Sports, Science and Technology of Japan announced the mid-term evaluation of "Super Science High School" program. In order to cultivate future international scientific and technological talents, the Ministry of Education, Culture, Sports, Science and Technology proposed to designate colleges and universities that carry out relevant research and development for science, technology, and mathematics education (hereinafter referred to as "science education") as "Super Science Institutions of Higher Learning" (hereinafter referred to as "SSH"), and develop courses with a focus on science, mathematics, and other related subjects, and cooperate with universities to promote advanced science education. See [here](#) for details of the evaluation results.

The SSH Planning and Evaluation Conference collaborators conducted a mid-term evaluation of 26 schools newly designated as development-oriented and practice-oriented (designated period: 5 years) in 2020 and 1 school newly designated as pilot reform-oriented (designated period: 3 years) in 2021.

South Korea

According to a report on February 23, 2023, South Korea will promote the digital transformation of basic education based on the "Digital Based Education Innovation Program". South Korea will select 300 schools this year and designate a total of 700 schools as "digital pilot schools" by 2024, taking the lead in applying AI digital textbooks in its formal and after-school courses. "Digital Based Education Innovation Program" proposes that South Korea will promote the Digital transformation of basic education from five aspects: "developing digital textbooks by using AI technology and data science", "centralized training for training competent teachers", "developing teaching and learning methods by using digital technology", "operating a 'digital pilot school' centered on the Demonstration Education Department" and "expanding the digital infrastructure". Specific content [here](#).

On March 14, 2023, the South Korean Ministry of Education and the Future Education Research Institute of Lihua Women's University held the "6th Digital Talent Training Hundred Talent

Seminar" at Lihua Women's University. The forum was attended by more than 180 people, including experts from the Municipal Education Department, universities, academic societies, research institutions, teacher research associations, relevant industry associations, as well as students and parents, The theme is "the changes and challenges brought by artificial intelligence represented by ChatGPT to educational practice" and "the application directions of ChatGPT at home and abroad". Vice Minister of Education Luo Zhoufan said, "The Ministry of Education will continue to make efforts in the future to flexibly respond to new technologies such as ChatGPT and effectively apply them in educational practice." Details [here](#).

Malaysia & Singapore

From March 28 to March 31, Boao Forum for Asia Annual Conference 2023 was held in Boao, Hainan Province, China. About 2,000 representatives from more than 50 countries and regions participated offline. Malaysian Prime Minister Anwar attended the annual meeting from March 29th to April 1st and paid an official visit to China. Malaysia's Minister of Science, Technology, and Innovation, Zheng Likang, stated in an interview with Xinhua News Agency reporters in Kuala Lumpur on March 13th that China has achieved fruitful results in scientific and technological innovation, and has rich experience in benefiting people's livelihoods through technology. He looks forward to further deepening Malaysia-China scientific and technological exchange and co-operation and welcomes Chinese technology companies to invest in Malaysia for common development. Details [here](#).

On April 1, 2023, Malaysia-China Economic and Trade Forum was held in Beijing. During the forum, Illume Research and Malaysia Education Group signed a framework agreement to deepen cooperation. The two sides will collaborate on empowering teenagers in the education of scientific innovative thinking, assisting the cultivation of Malaysian youth talents on science innovation, and providing comprehensive teaching and services. Details [here](#).

From 13 to 19 May 2023, Eight Singapore students competed against more than 1,600

students from 64 countries, regions, and territories at the Regeneron International Science and Engineering Fair (ISEF) 2023 and won seven awards. Regeneron ISEF is one of the world's largest annual pre-college science fairs that provides a platform for top science and engineering talents to showcase their projects. Details [here](#).

If you have any information about events, publications, research groups or books about HPS&ST in Asia and want to submit a brief note to be published in the HPS&ST Newsletter, please contact first Xiao Huang (Zhejiang Normal University) [HERE](#) or secondly Michael Matthews [HERE](#).

Cultural Studies in Science Education: An Appraisal

An Open Access paper 'Cultural Studies in Science Education: A philosophical Appraisal' (Michael R. Matthews) has been published in *Cultures of Science* journal (May 2023).

Abstract: The emergence of cultural studies as a scholarly programme and its adoption in science education are outlined; problems flowing from its commitment to Thomas Kuhn's epistemological relativism and ontological idealism are detailed; the gulf between the citing and the reading of Kuhn is noted; the malaise of obscurantist writing is documented; finally, problems of pursuing cultural studies research without philosophical input are indicated.

The paper is available [HERE](#).

International Society for History, Philosophy and Social Studies of Biology (ISHPSSB) biennial conference, 9-15 July 2023, Toronto

Keynote speaker, [Deborah McGregor](#) (York University) will present on climate and environmental justice, and an interdisciplinary public panel will discuss how environmental degradation, indigeneity, human right to water and

health all intersect in and around the Great Lakes. The panelists are Patricia Corcoran (University of Western Ontario), Blaire Morseau (University of Massachusetts Boston), Jennifer Read (University of Michigan), and Marsha Richmond (Wayne State University).

These conversations will be complemented with a tour of the Royal Ontario Museum natural history and world cultures collections, walking through the causes, consequences and solutions to climate crisis.

Please visit the [conference website](#) to submit abstracts.

Opinion Page. 'Education: Philosophy's Blindspot'*

*DAVID BAKHURST, Philosophy Department,
Queen's University, Canada*

David Bakhurst is George Whalley Distinguished University Professor and John and Ella G Charlton Professor of Philosophy at Queen's University in Ontario. He completed his undergraduate degree in philosophy at the University of Keele, and his doctoral degree at Oxford University.

He is the author of [Consciousness and Revolution in Soviet Philosophy](#) (1991), [The Formation of Reason](#) (2011) and [The Heart of the Matter: Essays on Llyenkov, Vygotsky and the Courage of Thought](#) (2023). He is a fellow of the Royal Society of Canada, and executive editor of the *Journal of Philosophy of Education*.



You might think it obvious that any list of topics worthy of sustained philosophical investigation would include education, along with mind, knowledge, language, morality and so on. Education, one would think, is a subject-matter of immense practical, real-world import that invites philosophical reflection, and that reflection in turn promises to illuminate not just education itself but some of philosophy's most enduring questions.

However, hardly any contemporary philosophers see things this way. Of course, most philosophers today work in institutions of higher education, and many take their teaching seriously and do a good job of it. So, they care about education in that sense. They just don't think that education matters as a subject of philosophical inquiry, and moreover, they take a rather dim view of those of us who do.

The distinguished philosopher Philip Kitcher is an exception that proves this rule, but it is noteworthy that in the preface to his recent book, *The Main Enterprise of the World: Rethinking Education* (2022), he laments that most philosophers think of the sub-discipline of 'philosophy of education' as an academic slum occupied by intellectual mediocrities who produce dull and unsophisticated work. Kitcher himself dissents from this view, but he is right that it's the prevailing opinion. Most philosophers are content to see philosophy of education as a backwater and

are unmotivated to engage with it because they don't believe that education matters to philosophy.

Lack of interest in education is not confined to analytic philosophy, but it is particularly marked in that tradition. I was an undergraduate at Keele University in the late 1970s and a doctoral student at Oxford in the 1980s. I don't remember philosophers at either institution staging lectures or seminars on philosophy of education the entire time. It was only when I went to Russia to research the philosophical culture of the Soviet Union that I encountered thinkers who believed education to be of such critical importance in human life that no serious philosopher could fail to take an interest in it. Of course, that is not a distinctively Russian or Soviet view. Many luminaries in the history of philosophy have had things to say about education – Plato, Aristotle, Locke, Rousseau, Kant, Mill, Whitehead, and Dewey to name a few – and educational themes can be discerned in the writings of the later Wittgenstein, Iris Murdoch, and others, though this usually goes unnoticed and unremarked.

Admittedly, there was a brief period in the 1960s and 1970s when Richard Peters, Paul Hirst, Robert Dearden and others at the Institute of Education in London brought the methods of analytic philosophy to bear on educational issues and encouraged a number of prominent philosophers, such as Gilbert Ryle, Michael Oakeshott and John Passmore to explore educational themes. And in the US, Israel Scheffler at Harvard produced significant writings on rationality and education. But while this 'analytic philosophy of education' inspired important work, its influence on the philosophical mainstream has been minimal, so that now the philosophy of education is often considered something no self-respecting philosopher need bother with, something that should be left to suitable persons in faculties of education and teacher training (a misconceived attempt at delegation since many such schools have long since lost interest in matters philosophical, but that's another story).

Education and Humanity

So let me spell out why exactly education *should* matter to philosophy. The reason is that education makes us what we are. Human beings do not enter

the world with their rational powers ‘up and running’. Those powers are actualised in the child in a process of formation, or education in the broadest sense (the ‘upbuilding’ of a human being, as Kitcher puts it, quoting Ralph Waldo Emerson). This occurs through the acquisition of natural language and the conceptual structures embodied therein, through initiation into styles of thinking and reasoning, and the assimilation of communal practices that structure the normative landscape in which children must learn to orientate themselves.

Human individuals do not have to find the world anew; they are the beneficiaries of a cultural legacy, the appropriation of which enables them to relate to the world as an object of knowledge. This is true of every human child, though it applies equally to those who participate in any particular domain of knowledge. As philosophers, for example, we enter an ongoing conversation – to invoke a favourite image of the English philosopher Michael Oakeshott’s – and we have the benefit of, or are hampered by, that which has come before as it is manifested in contemporary belief and practice. Education is the [formation of reason](#), the vehicle of human possibility. Anyone who wishes to understand the ways in which mind, reason and knowledge are expressed in human life had better have education in view.

If this is so, then ‘education’ refers not only to certain contingent practices of knowledge transmission, but to a constitutive element of the human life-form. To see this, it’s worth reflecting on what the American philosopher Michael Thompson in [Life and Action](#) (2008) calls ‘natural-historical’, the kind deployed in biology textbooks, nature documentaries and natural history museums to characterise life-forms by saying, for example: ‘The wolf travels in a nuclear family consisting of a mated pair and their offspring, and engages in the cooperative hunting of prey, usually large, hooved mammals and smaller animals’ or ‘In the mating season, the bull moose stops feeding for two weeks.’

It is important that such descriptions can be true of ‘the wolf’ or ‘the moose’, even though *this* wolf might be lone, and *that* moose might not fast. *The* dog is four-legged, even if Fido has only three. Natural-historical description is thus inherently normative: it describes how a creature of this kind *ought* to be. One who departs from the norm, such

as poor Fido, is to that extent ‘abnormal’ or ‘defective’.

Since we are animals, natural-historical description of the human being should be possible. But can we, for instance, give a natural-historical description of what ‘the human being’ eats? The German philosopher Sebastian Rödl thinks not. Of course, we can say what the human digestive system can process. But an account of human food is a cultural-historical, not a natural-historical, undertaking. Human practices of food production, preparation and consumption show enormous variation across time and place, and any attempt to characterise them will take us swiftly into the history of horticulture, agriculture and animal husbandry, and into the cultural norms that govern what is consumed and how.

And it’s not just food. Human beings do not have a ‘natural habitat’ any more than a natural diet, and there are no natural-historical truths about the number of children human beings have, or how parental duties are divided, or the role the extended [family](#) plays in child-rearing, or about sexual preference or gender identity. And hence these practices are not governed by natural norms, deviation from which constitutes ‘defectiveness’.

This shows, Rödl concludes (and I agree), that human beings do not have a nature in quite the way that nonhuman animals do; or, as he [puts it](#), relishing the paradox: a ‘human being has her nature not by nature’. We enjoy powers of self-determination that enable us to decide for ourselves what to think and do in light of what there is reason to think and do. This is what it is for a natural animal to be free. For us, the question ‘How should we live?’ is not decided by our biology but can always meaningfully be posed whatever constraints – physical, biological, historical, cultural – we may happen to labour under.

Reason and Education

In my view, however, there remains at least one natural-historical judgment that is true of the human: the human being is a rational animal, whose powers of reason are brought to actuality only through education. This captures the centrality of education to our life-form. The human child is born into a world in which reason

is 'externalised' in so many forms – in spoken language, of course, but also in artefacts, in the written word and other media, in practices of enquiry, reasoning, teaching, and in copious forms of intelligent and creative activity. Children's powers of reason find expression as they become at home in this world. But that doesn't happen just by maturation. It's possible only with the help of others. That's why education is not a merely contingent addition to the human life-form. Education is reason's vehicle.

With this in view, it seems obvious that education should matter to philosophy. And not just because education raises new and unexplored issues, but because it provides opportunity for a fresh approach to old issues that philosophy has traditionally struggled with. We start to see, for instance, that an adequate epistemology must recognise that the manner in which knowledge is acquired, communicated and shared is internal to the nature of knowledge itself, and that the metaphysics of personhood needs to countenance the *formation* of reason if we are to understand how rationality and animality are united in the human person.

To speak of education as the 'formation of reason' might seem to suggest a rather narrow, even elitist, focus on the cultivation of intellectual abilities – on interpretation, reasoning and argument conceived as skills of 'critical thinking'. This is not my intention. I believe we should work with a more expansive conception of reason's domain. It's not just that we must consider reason in the service of determining what to believe (theoretical reason, so-called) *and* reason devoted to deciding what to do (practical reason). We need to recognise that, in both the theoretical and the practical, responsiveness to reasons is not always the outcome of reasoning or deliberation.

Of course, sometimes we think our way to a conclusion about what to think or do. But often our response to reasons is spontaneous and intuitive, more like perceptual awareness than logical thought. It's as if we *see* the contours of the normative terrain we are negotiating and are moved accordingly. Musicians improvising together, soccer players perceptively running into space and interchanging passes, or artists creating 'in the flow', are no less navigating the 'space of reasons' than lawyers building a case,

mathematicians setting out a proof, or financial experts weighing up the pros and cons of an investment strategy. Reason is operative in the former cases, no less than in the latter, even if the agents' reasons can be described only retrospectively, and then perhaps by their showing, rather than telling, why they did what they did.

So, the formation of reason includes far more than the cultivation of powers of reasoning. It concerns how we come to understand the boundaries of appropriate behaviour, in learning how to play and pretend, express affection and love, make friends, stand up for oneself, control emotion, moderate desire, and so on. It thus begins in such mundane things as learning to eat with a spoon and to use the toilet, acquiring good sleep patterns, and it is presupposed by all the multivarious, norm-governed practices that pervade human life.

Philosophy of Education

Philosophy of education is particularly well placed to make sense of this and to push back against the dualistic assumptions – between mind and body, the rational and the emotional – that pedagogical thinking has often inherited from philosophy. Such binary oppositions inspire educational divisions between the academic and the applied, the intellectual and the vocational, the mental and the manual, where the former of each pair is consistently valued over the latter. But with a more expansive view of reason, we can appreciate how intelligence is embodied in practical activity in a way that challenges these class-bound dichotomies and makes, not just for better philosophy, but for richer ways of organising educational institutions, designing curricula, and understanding what it is to educate a person.

Consider, for example, the concept of habit. Philosophers have rarely had much to say about habit, and what they have said tends to construe habits as something mechanistic and non-rational. Even Gilbert Ryle, for all his disdain for dualism, portrays a habit as an unintelligent pattern of behaviour established by 'drilling' (by which he means something like conditioning). But this does habit a disservice, because a great deal of habit informs intentional thought and action. Only consider 'habits of mind', which can surely embody intelligence.

In educational contexts, developing the right kind of habits is crucial: habits of studying, reading, listening, speaking, explaining, considering and reconsidering, and so on (here I have in mind habits that govern not just *that* one reads, studies or listens etc, but *how* one does so).

Once we grant that responsiveness to reasons does not require overt reasoning, we stand a chance of giving a more satisfying account of habit, which might in turn provoke serious educational thinking about its cultivation. It's not just that education should matter to philosophy. Philosophy of the right kind can inform and inspire education.

How likely is it that philosophers in the mainstream will wake up to education's philosophical significance? I think that the prospects are good, because many of the prejudices that inhibited philosophers from taking education seriously are on the wane. For instance, the robust individualism that dominated so much analytic epistemology and philosophy of mind in the previous century – a legacy of British empiricism and 20th-century positivism – has yielded to an intellectual culture that is able, and often willing, to entertain ideas about the social preconditions of knowledge and mind.

The field of social epistemology is now well established and, although its practitioners have been a little slow to interest themselves in education, it is easy to see there are fertile areas waiting to be explored. And in philosophy of mind, there is growing recognition that our mental lives are [embodied](#) and enacted, and that they extend beyond the skull – views that, properly developed, can be allied to the expansive conception of reason that befits the study of education.

Moreover, philosophers today are also more willing to engage in work that requires them to be empirically informed, and to value interdisciplinary and collaborative research, and this should make them more open to exploring the messy actuality of education and its role in human development. Another salutary development is the gradual erosion of the division between analytic and [continental](#) traditions of philosophy, enriching the terms of philosophical discourse and making

available concepts, such as [Bildung](#), that have no immediate correlate in Anglophone philosophy.

Of course, one of the reasons that philosophy disdained education was no doubt sexism. In the male-dominated domain of analytic philosophy, with its fondness for methods adversarial and gladiatorial, it can be no real surprise that attention did not alight on issues relevant to the nurturing and upbringing of children. Fortunately, the philosophical universe is less male dominated than it used to be and, though there may be a long way to go, its practitioners are now usually open to more constructive and less combative modes of engagement.

But other obstacles remain. One is the tendency towards narrow specialisation that infects so much academic research, including philosophy. This is particularly disastrous for the study of education, where we often find epistemic, metaphysical, ethical and political matters densely interwoven.

Another factor is that it is not unusual for philosophers to resent the time they spend teaching in educational institutions as a distraction from the real work of writing and research. So, making education an object of one's study might seem like a busman's holiday, and perhaps that contributes to the feeling that doing philosophy of education is slumming it. But such a view is hard to sustain once one begins to see philosophical richness in the everyday realities of teaching and learning.

I have made the case that education should matter to philosophy by arguing that education, very broadly conceived (as formation or self-development), is central to the human life-form, and by exploring some of the metaphysical and epistemic questions that come into view when one recognises this. I have said very little about the philosophical dimensions of formal education – schooling and higher education – and of course a good deal of work in philosophy of education is devoted to such matters. Indeed, those mainstream philosophers who have ventured into the field have usually done so to address moral and political issues raised by formal education.

One familiar theme is that schools and universities have a central role to play in any vibrant democracy, equipping students, not just with

relevant knowledge, but with the tools to think critically, so that they can make informed choices about how to live and contribute to democratic deliberation.

Some have defended the humanities and, more generally, a broadly liberal arts education, not just for honing critical reasoning, but for opening up to students things of genuine value, educating them in what matters, and thereby giving them a chance to choose among ways of living that are genuinely worthwhile. Sadly, throughout the world, and conspicuously in the United States, the ideals of democracy are so beleaguered that such discussions look increasingly utopian. But they are all the more relevant for that. For what can protect us, our children and our children's children, from the post-truth world of alternative facts, the reduction of political discourse to lies, name-calling and abuse, from climate-crisis deniers, vaccine sceptics, and science-haters? What can inure us against conspiracy theories and the treacherous influence of social media? What can equip us to confront the injustices and evils of the past? Education – more and better – has to be a big part of the answer to these questions. That's another blindingly obvious reason why philosophers should take education seriously.

Education and Democracy

Education's relation to democracy is a central theme in a text I mentioned earlier: Philip Kitcher's *The Main Enterprise of the World*. This book is an exemplary contribution to the philosophy of education and deserves to be taken seriously. Kitcher combines a broad vision of the centrality of education in human life with discussion of many concrete questions about how schools should be organised, curricula designed and so on. The discussion is framed by the big question: what is education for? He argues that the way politicians and policy-makers answer this question is usually distorted by economic priorities. They think educational institutions exist to prepare the young for the workforce, and thereby to contribute to their nation's ability to compete in the global capitalist, or more generally, economic arena.

But such an answer is myopic and, moreover, out of step with economic reality. With increasing automation and global outsourcing, there will be

less and less desirable work to prepare students for, and the majority of tomorrow's workforce will find itself in service jobs. In the light of this, we must rethink our priorities. We need to recognise the value of service work and reward it accordingly. And we need to embrace the view that education exists to prepare students not just to make a living, but to lead flourishing lives, and to equip them for democratic citizenship. If there are ways that economic reality is out of kilter with this richer conception of education, then we should put education first and change reality accordingly.

Kitcher embraces [John Stuart Mill](#)'s view that a flourishing life must be 'one's own' as it were – a life one has, in some sense, *chosen*. This means that we must educate for autonomy, so that students are enabled to decide for themselves how to live. Of course, we want to equip students not just to choose, but to make *good* choices. How are we to reconcile this 'perfectionist' sensibility with liberalism's reluctance to take a stand on where the good lies?

Kitcher responds by introducing a social dimension into his vision of flourishing. Individuals' life-projects should be freely chosen, but they should aim not just at personal flourishing, but at the flourishing of others, including future generations. Our lives must contribute to the human project by being to the benefit of humankind.

This view takes inspiration from [John Dewey](#), and so too does Kitcher's conception of education and democracy. Kitcher – who, as it happens, is John Dewey Professor Emeritus of Philosophy at Columbia University in New York – is inspired by Dewey's idea of democracy as a way of life. Because the institutions of representative democracy are prone to familiar failings, he endorses Dewey's conception of deliberative democracy in which inclusive, informed and engaged dialogue among citizens seeks outcomes that are acceptable to all, in a spirit of mutual recognition and respect. If such a vision is to be realised, children must be introduced to democratic practice as early as possible, so this must become part of the ethos of the school.

As for curriculum, Kitcher favours a broad general education in science and mathematics with

specialised studies limited to those who are genuinely interested in pursuing science seriously. He also makes a strong case for the humanities, music, and the arts. Aesthetic experience, he argues, is a vital part of life but, since the range of such experience is vast, and individual responses so variable, students should be helped to find forms of literature, art, or music they enjoy and can relate to. Such attention to the interests of the individual learners is crucial to Kitcher's vision of pedagogy, so class size is to be kept as small as possible (eg, under 10 students) and teachers should be complemented by educational aides from the wider community, who can share their experiences, counsel, enlighten and inspire. As they mature, students should be helped to explore the diversity of human possibility through increasingly sophisticated forms of history, geography, psychology and social science.

Just as democracy is a way of life, so too is education, and opportunities for participation in formal education – as students, teachers or as both at once – should be open to citizens throughout their lives.

Kitcher is aware that it would require massive social change for such a conception of education to become reality. In addition to respecting all forms of socially valuable work, we must do away with the obscene inequalities of wealth, eradicate the stereotypes and prejudices that are impediments to mutual recognition and epistemic justice, quieten the desire for the mindless accumulation of cheap consumer goods, and overcome the relentless economic imperative to maximise productivity. Only then can we have a 'Deweyan society' in which citizens, committed to life-long education, flourish in a truly democratic order where they devote themselves to finding mutually acceptable solutions to the problems, big and small, that confront them.

All this might seem utopian, but it would be wrong to dismiss Kitcher's bold vision as wishful thinking or revolutionary posturing. True to Dewey, his aim is actually [pragmatic](#): to articulate ideals to enable us to move gradually from where we are towards something better. The challenge is not to build a utopia from scratch, but to solve a kind of simultaneous equation – since the creation of a society in which education finds its proper place itself depends on education – by steadily

working towards the mutual rejuvenation of education and society guided by ideals that are open to revision in light of how things go. Kitcher takes heart from examples of the dramatic moral progress that has occurred in recent years, for example on such matters as gender equality and same-sex marriage. These are cases where beliefs, attitudes and practices that were once derided are now widely endorsed. If such moral progress is possible, then maybe the Deweyan society is too.

Kitcher's book makes vivid why education should matter to philosophy. Its publication is important for, when a thinker of Kitcher's stature turns to an issue, this is likely to attract attention. This will, I hope, stimulate new interest in philosophical studies of education. And this is all to the good, so long of course that those so stimulated do not think of the field as virgin soil but take an interest in what has already been achieved by philosophers of education.

Kitcher makes reference to a number of figures he respects (including Harry Brighouse, Randall Curren, Catherine Elgin, Meira Levinson and John White), but there are many others he might have drawn on. Not only is there much insightful writing on Dewey's educational ideas, but there are numerous philosophers of education who have fruitfully pursued many of the issues Kitcher addresses from a wide variety of perspectives. Consider, for example, René Arcilla, Nicholas Burbules, Joseph Dunne, Jan Derry, Megan Laverty, Michael Peters, Paul Smeyers, Richard Smith, Paul Standish, Harvey Siegel, Denis Phillips and Christopher Winch, to name but a few.

I do not mean to be critical of Kitcher. Given the breadth of his vision, and the amount of ground his ambitious book has to cover, he can only do so much. But to those he convinces that education matters to philosophy, I recommend they spend some time with the recently published [Handbook of Philosophy of Education](#) (2022), edited by Randall Curren, which presents a fascinating array of philosophical inquiries into a multiplicity of educational matters, showcasing many of the leading practitioners; or the [Oxford Handbook of Philosophy of Education](#) (2009) edited by Harvey Siegel. These should leave you in no doubt that the philosophical study of education is not an

intellectual slum, but a rather attractive and engaging city of ideas.

This essay draws on themes in my papers *'Teaching and Learning: Epistemic, Metaphysical and Ethical Dimensions'* (2020) and *'Human Nature, Reason and Morality'* (2021), both published in the Journal of Philosophy of Education. Some of the ideas presented here are developed at greater length in my book *The Formation of Reason* (2011), which takes inspiration from the philosophy of John McDowell, as well as the Russian thinkers Evald Ilyenkov and Lev Vygotsky.

* First published in [Aeon](#) magazine 6 January 2023

Invitation to Submit Opinion Piece

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, and downloadable, in the OPINION folder at the HPS&ST web site [HERE](#):

Varia

- HPS&ST books, downloadable files [HERE](#)
- *Nature of Science for Social Justice: Why, What and How?* Lena Hansson & Hagop A. Yacoubian (eds). Introductory 21-page chapter available [HERE](#)
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- *Coulomb's Memoirs on Torsion, Electricity, and Magnetism Translated into English*, A.K.T. Assis and L.L. Bucciarelli (eds.), Apeiron, Montreal), 546 pages, ISBN: 978-1-987980-33-2, available free in PDF format [HERE](#)
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- The 2023 IHPST-LA conference will be held in Porto Alegre – Brazil (August 9-11), and its theme will be HPS&ST in times of science-denial. Information about the event (dates, work submission, costs) are already available at [HERE](#)

American Chemical Society, History Award

The recipients of the 2023 Joseph B. Lambert HIST Award of the History of Chemistry (HIST) Division of the History of Chemistry of the American Chemical Society are Professor Geoffrey Rayner-Canham and Professor Marelene Rayner-Canham.

The HIST Award is for outstanding achievement in the history of chemistry and is international in scope. This award is the successor to the Dexter Award (1956-2001) and the Sydney M. Edelstein Award (2002-2009), also administered by the Division of the History of Chemistry (HIST) of the American Chemical Society.

The HIST Award consists of an engraved plaque and a check for \$1500, and will be presented to the Rayner-Canhams at the fall national meeting of the American Chemical Society in San Francisco in August, 2023. Additional information about the award can be found on the HIST [HERE](#)

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Arthur, R. T. W. et al. (Eds.) (2023). *Leibniz: Publications on Natural Philosophy*. Oxford, UK: Oxford University Press. ISBN: 9780192843531

“This is the first volume compiling English translations of Leibniz's journal articles on natural philosophy, presenting a selection of 26 articles, only three of which have appeared before in English translation. It also includes in full Leibniz's public controversies with De Catelan, Papin, and Hartsoeker.

The articles include work in optics, on the fracture strength of materials, and on motion in a resisting medium, and Leibniz's pioneering applications of his calculus to these issues by construing them as mini-max and inverse tangent problems.

Other topics covered by the articles include: criticisms of the Cartesian estimate of motive force and Leibniz's proposal of a different way of estimating force to replace it; a proposed theory of celestial motions and gravitation, and derivation of the inverse square law; challenge problems concerning the isochronous curve and the catenary; a sample of work on gaming theory; and Leibniz's critique of atomism.”
(From the Publisher)

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Bellis, D., Garber, D., & Palmerino, C. R. (Eds.) (2023). *Pierre Gassendi: Humanism, Science, and the Birth of Modern Philosophy*. Milton Park, Abingdon: Routledge. ISBN: ISBN 9781138697454

“Pierre Gassendi (1592–1655) was a major figure in seventeenth-century philosophy and science and his works contributed to shaping Western intellectual identity. Among “new philosophers,” he was considered Descartes’s main rival, and he belonged to the first rank of those attempting to carve out an alternative to Aristotelian philosophy. In his writings, he promoted a revival of atomism and Epicureanism within a Christian framework, and advocated an empiricist and probabilistic epistemology which was to have a major impact on later thinkers such as Locke and Newton. He is moreover important for his astronomical work, for his defense of Galileo’s mechanics and cosmology, and for his activity as a biographer.

“Given the importance of Gassendi for the history of science and philosophy, it is surprising to see that he has been largely ignored in the Anglophone world. This collection of essays constitutes the first book on Gassendi in the English language that covers his biography, bibliography, and all aspects of his work.

The book is divided into three parts. Part I offers a reconstruction of the genesis of Gassendi’s Epicurean project, an overview of his biography, and analyses of Gassendi’s early attacks on Aristotle, of his advocacy of Epicurean philosophy, and his relation to the skeptical tradition and to Cicero’s thought. Part

II addresses Gassendi as a participant in seventeenth-century philosophical and scientific debates, focusing especially on his controversies with Descartes and Fludd. Part III explores Gassendi’s contributions to logic, theories of space and time, mechanics, astronomy, cosmology, and the study of living beings, and presents the reception of Gassendi’s thought in England.

“This book is an essential resource for scholars and upper-level students of early modern philosophy, intellectual history, and the history of science who want to get acquainted with Pierre Gassendi as a major philosopher and intellectual figure of the early modern period.”
(From the Publisher)

More information [HERE](#)

Bout, P.V., Dickman, R., & Plunkett, A. (2023). *The ALMA Telescope: The Story of a Science Mega-Project*. Cambridge: Cambridge University Press. [Open Access]

“ALMA, the Atacama Large Millimeter/submillimeter Array, situated high in the Chilean desert, is the largest ground-based telescope on Earth. This is an insiders' account of how this complex mega-project came to fruition from authors with intimate knowledge of its past and present. The separate roots of ALMA in the United States, Europe, and Japan are traced to their merger into an international partnership involving more than 20 countries.

The book relates the search for a suitable telescope site, challenges encountered in organization, funding, and construction, and lessons learned along the way. It closes with a review of the most significant results from ALMA, now one of the most productive telescopes in the world.

Written for a broad spectrum of readers, including astronomers, engineers, project managers, science historians, government officials, and the general public, the eBook edition is available to download as an Open Access publication on Cambridge Core.”
(From the Publishers)

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Cutter, A. D. (2023). *Evolving Tomorrow: Genetic Engineering and the Evolutionary Future of the Anthropocene*. Oxford, UK: Oxford University Press.

“The Anthropocene defines the here-and-now time period on Earth of indelible (and possibly irreversible) human disturbance to the natural world, from habitat destruction and mass extinction to global climate change. To ameliorate and repair the damage that threatens the world's dwindling resources and our very existence, humanity is enacting massive interventions to fuse modern technologies with long established natural processes. Advances in genetic engineering have put us on the cusp of directly shaping the DNA of every living organism (including ourselves), as well as determining the evolution of completely novel species.

The author invites the reader to explore how humans have manipulated the ancient forces of evolution and the future possibilities of genetic engineering for conservation and rewilding, de-extinction, and even the creation of viable populations of entirely new species. To entertain such possibilities of synthetic biology, he forces us to wrestle with the threats and ethical conundrums that surround the unintended consequences, as well as the values that humanity places on authenticity in nature. In so doing, this accessible and thought-provoking book explores the potential future of life on planet Earth.” (From the Publisher)

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Gabriel, R. (2023). *A Suspicious Science: The Uses of Psychology*. Oxford, UK: Oxford University Press. ISBN: 9780197513583

“From self-help to medication, therapy, and cognitive neuroscience, this book traces the uses and limits of psychology. Offering a systematic exploration of the ways in which psychology is used in contemporary society, it refines our understanding of the extent of the field. In addition to conceptual analysis of how science, truth, biology, mind, and meaning intersect and interact in the mind sciences, A

Suspicious Science draws from history and anthropology to articulate an interdisciplinary multi-level form of psychology that may serve to orient the field.

The book synthesizes debates in psychology and philosophy concerning methodology and the nature of explanation with debates about its practical context as a human science. Ultimately, it suggests psychology provides us myths and rituals that ground a particular sense of meaning and motivation in our lives. By aligning cultural, emotional, and philosophical uses of psychology, this book clarifies a synoptic, humanistic model of the mind within the human sciences.” (From the Publisher)

More information [HERE](#)

Hansen, T.F., Houle, D., Pavličev, M., & Pélabon, C. (Eds.) (2023). *Evolvability: A Unifying Concept in Evolutionary Biology?* Cambridge, MA: The MIT Press.

“Evolvability—the capability of organisms to evolve—wasn't recognized as a fundamental concept in evolutionary theory until 1990. Though there is still some debate as to whether it represents a truly new concept, the essays in this volume emphasize its value in enabling new research programs and facilitating communication among the major disciplines in evolutionary biology. The contributors, many of whom were instrumental in the development of the concept of evolvability, synthesize what we have learned about it over the past thirty years. They focus on the historical and philosophical contexts that influenced the emergence of the concept and suggest ways to develop a common language and theory to drive further evolvability research.

“The essays, drawn from a workshop on evolvability hosted in 2019–2020 by the Center of Advanced Study at the Norwegian Academy of Science and Letters, in Oslo, provide scientific and historical background on evolvability. The contributors represent different disciplines of evolutionary biology, including quantitative and population genetics, evolutionary developmental biology, systems biology, and macroevolution, as well as the philosophy of science. This plurality of

approaches allows researchers in disciplines as diverse as developmental biology, molecular biology, and systems biology to communicate with those working in mainstream evolutionary biology. The contributors also discuss key questions at the forefront of research on evolvability.” (From the Publisher)

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Ivanova, M., & Murphy, A. (Eds.) (2023). *The Aesthetics of Scientific Experiments*. Milton Park, Abingdon: Routledge. ISBN: 9781032203881

“The relationship between aesthetics and science has begun to generate substantial interest. However, for the most part, the focus has been on the beauty of theories, and other aspects of scientific practice have been neglected. This book offers a novel perspective on aesthetics in experimentation via ten original essays from an interdisciplinary group comprised of philosophers, historians of science and art, and artists.

“The collection provides an analysis of the concept of beauty in the evaluation of experiments. What properties do practising experimenters value? How have the aesthetic properties of scientific experiments changed over the years? Secondly, the volume looks at the role that aesthetic factors, including negative values such as ugliness, as well as experiences of the sublime and the profound, play in the construction of an experiment and its reception. Thirdly, the chapters provide in-depth historical case studies from the Royal Society, which also allows for a study of the depiction of scientific experiment in artworks, as well as contemporary examples from the Large Hadron Collider and cases of experiments designed by artificial intelligence. Finally, it offers an exploration of the commonalities between how we learn from experiments on the one hand and the cognitive value of artworks on the other.

“*The Aesthetics of Scientific Experiments* will be of interest to researchers and advanced students working in philosophy and history of science, philosophy and history of art, as well

as practising scientists and science communicators.” (From the Publisher)

More information [HERE](#)

Killeen, K. (2023). *The Unknowable in Early Modern Thought: Natural Philosophy and the Poetics of the Ineffable*. Redwood City, CA: Stanford University Press. ISBN: 9781503635852

“Early modern thought was haunted by the unknowable character of the fallen world. The sometimes brilliant and sometimes baffling fusion of theological and scientific ideas in the era, as well as some of its greatest literature, responds to this sense that humans encountered only an incomplete reality.

“Ranging from *Paradise Lost* to thinkers in and around the Royal Society and commentary on the *Book of Job*, *The Unknowable in Early Modern Thought* explores how the era of the scientific revolution was in part paralyzed by and in part energized by the paradox it encountered in thinking about the elusive nature of God and the unfathomable nature of the natural world. Looking at writers with scientific, literary and theological interests, from the shoemaker mystic, Jacob Boehme to John Milton, from Robert Boyle to Margaret Cavendish, and from Thomas Browne to the fiery prophet, Anna Trapnel, Kevin Killeen shows how seventeenth-century writings redeployed the rich resources of the ineffable and the apophatic—what cannot be said, except in negative terms—to think about natural philosophy and the enigmas of the natural world.” (From the Publisher)

More information [HERE](#)

Parsons, K. M. (2023). *Why It's OK to Trust Science*. Milton Park, Abingdon: Routledge. ISBN 9780367616410

“Why trust science? Why should science have more authority than “other ways of knowing?” Is science merely a social construct? Or even worse: a tool of oppression? This book boldly takes on these and other explosive questions—lodged by ideologues on the left and the right—and offers readers a well researched

defense of science and a polemic addressed to its detractors.

“*Why It’s OK to Trust Science* critically examines the recent history of critiques of science, including those in academia from scholars like Bruno Latour, Simon Schaffer, and Thomas Kuhn. It then presents case studies drawn from recent advances in the field of dinosaur paleontology, showing how science generates objective knowledge, even during revolutionary episodes. The book next looks at how that same objective knowledge can be gained even when researching extremely complex issues, using climate science to distinguish between genuine skepticism—upon which science depends—from dogmatic denial.

“The book is for anyone who needs thoughtful, razor sharp responses to the detractors of science—whether they be anti-vaxxers, climate change deniers, profit-seeking businessmen, or published relativists in the knowledge-making industries.” (From the Publisher)

More information [HERE](#)

Reiss, M.J., & Ruse, M. (2023). *The New Biology: A Battle between Mechanism and Organicism*. Cambridge, MA: Harvard University Press. ISBN: 9780674972247

“The search for a unified framework for biology is as old as Plato’s musings on natural order, which suggested that the universe itself is alive. But in the twentieth century, under the influence of genetics and microbiology, such organicist positions were largely set aside in favor of mechanical reductionism, by which life is explained by the movement of its parts. But can organisms truly be understood in mechanical terms, or do we need to view life from the perspective of whole organisms to make sense of biological complexity?

“*The New Biology* argues for the validity of holistic treatments from the perspectives of philosophy, history, and biology and outlines the largely unrecognized undercurrent of organicism that has persisted. Mechanistic biology has been invaluable in understanding a range of biological issues, but Michael Reiss and Michael Ruse contend that reductionism

alone cannot answer all our questions about life. Whether we are considering human health, ecology, or the relationship between sex and gender, we need to draw from both organicist and mechanistic frameworks.

“It’s not always a matter of combining organicist and mechanistic perspectives, Reiss and Ruse argue. There is scope for a range of ways of understanding the complexity of life and biological systems. Organicist and mechanistic approaches are not simply hypotheses to be confirmed or refuted, but rather operate as metaphors for describing a universe of sublime intricacy.” (From the Publishers)

More information [HERE](#)

Vicedo, M. (2021). *The Story of Clara Park, Her Autistic Daughter, and the Myth of the Refrigerator Mother*. Boston: Beacon Press. ISBN: 978-080702562-8

“*Intelligent Love* examines the history of autism in the US through the story of Clara Park and her daughter Jessica. Clara Park was the first layperson who challenged the widespread view among psychiatrists and psychologists that cold, intellectual mothers pushed their children into autism.

“Park contested that view and called for parents’ experiences to be recognized as legitimate source of expertise. She also became an activist fighting for education and support for autistic people. In her writings, Park addressed issues of long-standing interest to historians of science such as the nature of evidence, the separation of the emotions and the intellect, the value of narrative accounts and experiential knowledge in medicine, and the importance of collaboration between medical experts and disabled people and their families. (From the Author)

More information [HERE](#)

Wills, H. et al. (Eds.) (2023). *Women in the History of Science: A Sourcebook*. Chicago, IL: The University of Chicago Press. ISBN: 9781800084162

“*Women in the History of Science* brings together primary sources that highlight women’s involvement in scientific knowledge production around the world. Including texts, images, and objects, the primary sources are each accompanied by an explanatory text, questions to prompt discussion, and a bibliography to aid further research. Arranged by time period, from 1200 BCE to the twenty-first century, and covering twelve inclusive and far-reaching themes, this book is an invaluable companion to students and lecturers alike in exploring women’s history in the fields of science, technology, mathematics, medicine, and culture.” (From the Publisher)

More information [HERE](#)

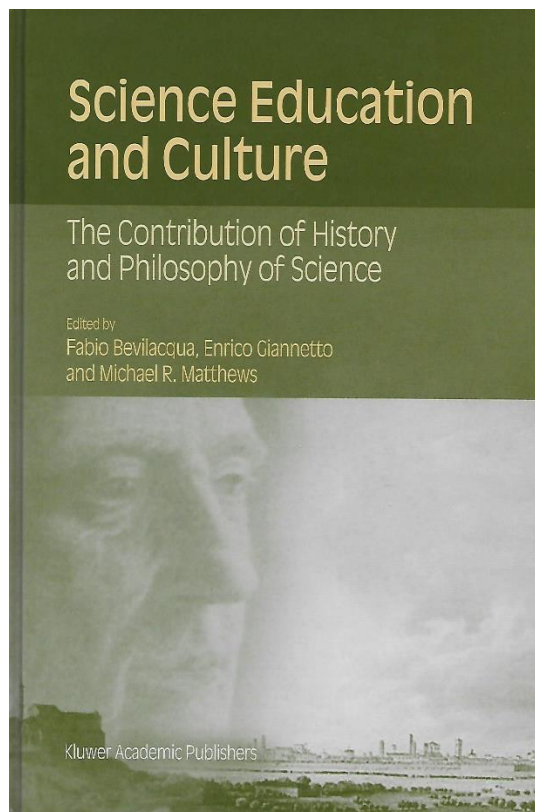
Authors of HPS&ST-related papers and books are invited to bring them to attention of the Newsletter’s assistant editor Paulo Maurício (paulo.asterix@gmail.com) for inclusion in these sections.

PhD Award in HPS&ST

We welcome publishing details of all PhDs awarded in the field of HPS&ST. Send details (name, title, abstract, supervisor, web link) to editor: m.matthews@unsw.edu.au

Science Education and Culture: The Contribution of History and Philosophy of Science. Book available

This 364-page anthology edited by Fabio Bevilacqua, Enrico Giannetto and Michael Matthews was published by Springer in 2001. It contains 21 papers authored by prominent historians and philosophers of science, philosophers of education, science educators and science teachers. It is expansive in its subject matter and detailed in its analysis.



PART ONE: History of Science, Education and Culture (7 papers)

PART TWO: Foundational Issues in Science Education (8 papers)

PART THREE: History, Philosophy and Physics Education (6 papers)

The common thread in all papers is the contribution that the history and philosophy of science makes to theoretical, curricular and pedagogical issues in science education.

A pdf file of the book is available [HERE](#).

Thomas Kuhn and Science Education: An Appraisal

A 70-page article ‘Thomas Kuhn and Science Education’ (Michael R. Matthews) has been published in *Science & Education* (DOI 10.1007/s11191-022-00408-1).

Abstract Beginning 60 years ago, Thomas Kuhn has had a significant impact across the academy and on culture more widely. And he had a great impact on science education research, theorising, and pedagogy. For the majority of educators, the second edition (1970) of his *Structure of Scientific Revolutions* articulated the very nature of the

science, the discipline they were teaching. More particularly, Kuhn's book directly influenced four burgeoning research fields in science education: Children's Conceptual Change, Constructivism, Science-Technology-Society studies, and Cultural Studies of Science Education.

This paper looks back to the Kuhnian years in science education and to the long shadow they cast. The discipline of science education needs to learn from its past so that comparable mistakes might be averted in the future. Kuhn's influence was good and bad. Good, that he brought HPS to so many; bad, that, on key points, his account of science and its philosophical implications was flawed. This paper will document the book's two fundamental errors: namely, its Kantian-influenced ontological idealism and its claims of incommensurability between competing paradigms. Both had significant flow-on effects.

Although the book had many positive features, this paper will document how most of these ideas and insights were well established in HPS literature at the time of its 1962 publication. Kuhn was not trained in philosophy, he was not part of the HPS tradition, and to the detriment of all, he did not engage with it. This matters, because before publication he could have abandoned, modified, or refined much of his 'revolutionary' text. Some-thing that he subsequently did, but this amounted to closing the gate after the horse had bolted. In particular, the education horse had well and truly bolted.

While educators were rushing to adopt Kuhn, many philosophers, historians, and sociologists were rejecting him. Kuhn did modify and 'walk back' many of the head-turning, but erroneous, claims of *Structure*. But his retreat went largely unnoticed in education, and so the original, deeply flawed *Structure* affected the four above-mentioned central research fields.

The most important lesson to be learnt from science education's uncritical embrace of Kuhn and Kuhnianism is that the problems arose not from personal inadequacies; individuals are not to blame. There was a systematic, disciplinary deficiency. This needs to be addressed by raising the level of philosophical competence in the discipline, beginning with the inclusion of HPS in teacher education and graduate programmes.

The article is available [HERE](#).

Coming HPS&ST Related Conferences

June 27-30, 2023, ASERA Annual Conference, Cairns, Australia

Details [HERE](#)

July 4-7, 2023, European Society for the History of the Human Sciences, Rome conference

Details [HERE](#)

July 9-15, 2023, ISHPSSB biennial conference, Toronto, Canada.

Details [HERE](#)

July 24-29, 2023, 17th DLMPST Congress, University of Buenos Aires

Information: [HERE](#)

August 9-11, 2023, IHPST-LA regional conference, Porto Alegre, Brazil

Details [HERE](#)

August 14-18, 2023, International Committee for History of Technology, 50th Conference, Tallinn, Estonia

Details [HERE](#)

August 28-Sept.3, 2023, ESERA biennial conference, Cappadocia, Turkey

Details [HERE](#)

August 30-Sept.1, 2023, Consonances Conference, Maynooth University, Ireland

Details: [HERE](#)

September 4-6, 2023, 3rd International Conference on History of Science and Education, Algrave, Portugal.

Details [Isilda Teixeira Rodrigues](#)

September 18-22, 2023, 42nd Scientific Instrument Symposium, Palermo, Italy

Details [HERE](#)

September 20-23, 2023, European Philosophy of Science Association (EPSA23), Belgrade, Serbia

Details [HERE](#)

November 9-12, 2023 History of Science Society (HSS), annual meeting, Portland OR.

Details [HERE](#)

November 29-December 2, 2023, 9th Norwegian Conference on the History of Science, Trondheim, Norway.

Details [HERE](#)

March 7-11, 2024, Philosophy of Education Society (PES) Annual Conference, Salt Lake City, UT

Details [HERE](#)

HPS&ST Related Organisations and Websites

[IUHPT](#) – International Union of History, Philosophy, Science, and Technology
[DLMPST](#) – Division of Logic, Mathematics, Philosophy, Science, and Technology
[DHST](#) – Division of History, Science, and Technology
[IHPST](#) – International History, Philosophy, and Science Teaching Group
[NARST](#) - National Association for Research in Science Teaching
[ESERA](#) - European Science Education Research Association
[ASERA](#) - Australasian Science Education Research Association
[ICASE](#) - International Council of Associations for Science Education
[UNESCO](#) – Education
[HSS](#) – History of Science Society
[ESHS](#) – European Society for the History of Science
[AHA](#) – American History Association
[FHPP APS](#) - Forum on History and Philosophy of Physics of the American Physical Society
[HAD AAS](#) - Historical Astronomy Division of the American Astronomical Society.
[ACS HIST](#) – American Chemical Society Division of the History of Chemistry
[GWMT](#) - Gesellschaft für Geschichte der Wissenschaften, der Medizin und der Technik

[ISHEASTME](#) – International Society for the History of East Asian History of Science Technology and Medicine
[EASE](#) - East-Asian Association for Science Education
[BSHS](#) – British Society for History of Science
[EPSA](#) - European Philosophy of Science Association
[AAHPSSS](#) - The Australasian Association for the History, Philosophy, and Social Studies of Science
[HOPOS](#) – International Society for the History of Philosophy of Science
[PSA](#) – Philosophy of Science Association
[BAHPS](#) - Baltic Association for the History and Philosophy of Science
[BSPS](#) – The British Society for the Philosophy of Science
[SPSP](#) - The Society for Philosophy of Science in Practice
[ISHPSB](#) - The International Society for the History, Philosophy, and Social Studies of Biology
[PES](#)– The Philosophy of Education Society (USA)

The above list is updated and kept on the HPS&ST website at: [HERE](#)

HPS&ST related organizations wishing their web page to be added to the list should contact assistant editor Paulo Maurício (paulo.asterix@gmail.com)

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