# HPS&ST Newsletter November 2023 Vol.36 (9)

ISSN: 2652-2837

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#### # Introduction

The HPS&ST Newsletter is sent monthly to about 11,000 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, <a href="mailto:m.matthews@unsw.edu.au">m.matthews@unsw.edu.au</a>.

# # Society for Philosophy of Science in Practice (SPSP) Tenth Biennial Conference

16–18 May University of South Carolina, Columbia, SC USA

Ann Johnson Institute for Science, Technology and Society

https://philosophy-science-practice.org/events/spsp2024-columbia

SPSP is an interdisciplinary community of scholars who approach the philosophy of science with a focus on scientific practice and the practical uses of scientific knowledge. For further details on

our objectives, see our mission statement: <a href="https://www.philosophy-science-practice.org/mission-statement/">https://www.philosophy-science-practice.org/mission-statement/</a>.

# # Trevor Levere Prize (2024)

Competition for the 2024 Trevor Levere Prize (*Annals of Science*) is now open. This prize is awarded annually to the author of an original, unpublished essay in the history of science, technology, or medicine, which is not under consideration for publication elsewhere. The prize, which is supported by Taylor & Francis, is intended for those who are currently doctoral students, or have been awarded their doctorate within the past four years. The winning essay is published in the Journal, and the author awarded US\$1000 and a free subscription to the *Annals of Science*. Details HERE

Submissions to: Mordechai Feingold (feingold@caltech.edu)

Deadline for applications: 15 February 2024.

# # The Center for Philosophy of Science, University of Pittsburgh, Lectures



The Center for Philosophy of Science at the University of Pittsburgh invites you to join us for our upcoming lectures. All lectures will be live streamed on YouTube **HERE** 

**Daniel Wilkenfeld**, November 10,12:00 pm - 1:30 pm EST,

**Title:** Pursuit-Worthy Research in Health: Three Examples and a Proposal

**Abstract:** In the ideal, we might want researchers and institutional reviewers from the populations affected by given research projects. However, that might not always be reasonable—for example, it

would be an unreasonable expectation of those with chronic fatigue syndrome to be heavily involved in guiding research projects. I explore three examples where health scientists had mistaken pursuits for various reasons. I then present the idea of deliberative research—the concept is based on that of deliberative democracy. Deliberative democracy is when decisions are made on the basis of reasons that would be acceptable to the target population; I argue that research decisions should be made on the basis of analogous reasons.

**Adrian Wuthrich,** Tuesday, November 14<sup>th</sup>, 12:00 pm - 1:00 pm EST Join the Zoom Link HERE

**Title:** Characterizing a Collaboration by Its Communication Structure

**Abstract:** I present first results of my analysis of a collection of about 24,000 email messages from internal mailing lists of a major particle physics collaboration during the years 2010–2013. I represent the communication on these mailing lists as a network in which the members of the collaboration are connected if they reply to each other's messages. Such a network allows me to characterize the collaboration from a bird's eye view of its communication structure in epistemically relevant terms. I propose to interpret established measures such as the density of the network as indicators for the degree of "collaborativeness" of the collaboration and the presence of "communities" as a sign of cognitive division of labor. Similar methods have been used in philosophical and historical studies of collective knowledge generation but mostly at the level of information exchange, cooperation and competition between individual researchers or small groups. The present analysis aims to take initial steps towards a transfer of these methods and bring them to bear on the processes of collaboration inside a "collective author."

Alan C. Love, Friday, November 17th, 3:30 EST

**Title:** The Biological Trait Concept and Character Identity Mechanisms

**Abstract:** Biologists frequently talk about characters, traits, features, phenotypes, and parts to pick out those aspects of cells, organisms, and

populations they want to investigate. However, they accomplish this in diverse and sometimes seemingly contradictory ways, and the theoretical question of what constitutes a biological trait is relatively neglected. Although it is unsurprising that there is no shared background theory about traits given the heterogeneous landscape of the life sciences, I argue that this is to be expected and there is more than one legitimate answer to what a trait is. In this respect, "trait" is on solid footing with other biological concepts that have several non-arbitrary interpretations and display multiple roles across different contexts (e.g., gene, homology, and species). In service of advancing theory on this theme, I outline the character identity mechanism framework and demonstrate how it yields increased contrastive resolution and novel predictions for comparative mechanistic biology. As a result, it addresses a challenge formulated by David Hull more than fifty years ago: "philosophers could have been of some service to biologists [by answering] the question—what is a character?"

# # National Institute of Education, Singapore, STEM Conference, 26-28 June 2024

ISTEM-ED 2024 invites STEM education researchers and practitioners to share and gain new insights into important topics related to STEM teaching, learning, evaluation, assessment, and research.

Four esteemed Keynote Speakers:

- Professor Yan Dong, Beijing Normal University, China
- Professor Lyn D. English, Queensland University of Technology, Australia
- Professor Gillian Roehrig, University of Minnesota, USA
- Assistant Professor Ban Heng Choy, National Institute of Education, Nanyang Technological University, Singapore

We invite presentations in the form of an individual paper, a poster, or a symposium, under one of the following strands in STEM education:

- STEM curriculum and teaching
- STEM teacher and teacher education
- STEM learners and learning

- STEM learning environment
- STEM education goals and policy
- STEM curriculum evaluation, and assessment
- Sociocultural issues in STEM education
- History, philosophy, epistemology, and nature of STEM and STEM education

Abstracts should be 250-300 words and in English.

#### Timeline

- Deadline for submission of Abstract: 28
   November 2023
- ISTEM-ED 2024 Conference: 26-28 June 2024

Details **HERE** 

# # Opinion Page: Why trust the experts?

ASHLEY GRAHAM KENNEDY, Florida Atlantic University

Ashley Kennedy is Associate Professor of Philosophy at the Honors College of Florida Atlantic University. She holds a BA in astronomy and physics and a PhD in philosophy from the University of Virginia. She completed a postdoctoral fellowship in biomedical ethics at the University of South Carolina, has held visiting appointments at the University of Helsinki and Columbia University Medical Center, conducted field research alongside the International Labor Organization in Myanmar, and served as a courtappointed volunteer *Guardian ad Litem* in Palm Beach County, Florida.

Her work bridges the sciences and the humanities, as well as the theoretical and the applied, and is both descriptive as well as prescriptive. Her main areas of research include medicine, science, and global justice.

She is author of <u>Diagnosis: a guide for medical</u> <u>trainees</u> (Oxford University Press 2021) and <u>Science and Public Policy: A philosophical</u> <u>introduction</u> (Routledge\_2023) and (is currently working on a third book, Child Labor in Global Context\_(Oxford University Press 2024)



[The editor: The subject matter of this essay connects with a number of previously published Opinion Page essays:

Chris Enke, Chemistry, University of New Mexico, 'The Science We Trust', HERE
Bettina Bussmann, Philosophy Department,
University of Salzburg, Austria & Mario
Kötter, Center for Biology Education at the
WWU, Muenster, Germany, 'Between
Scientism and Relativism: Epistemic
Competence as an Important Aim in Science
and Philosophy Education', HERE

Hugh Lacey, Swarthmore College & University of São Paulo, 'Appropriate Roles for Ethical and Social Values in Scientific Activity', HERE

Mario Bunge, Philosophy Department, McGill University, Montreal 'In Defense of Scientism', HERE]

#### Introduction

Scientific expertise, and indeed the definition of who counts as an expert at all, in any field, has become increasingly controversial in recent years. Perhaps the most significant reason for this is that the question of expertise and the issue of trust are closely connected: no one wants to listen to, or to follow recommendations given by, any "expert" that they do not trust. And this is understandable: we have to be able to trust our experts in order to

know that we are getting accurate information from them. On the one hand, some people tend to "under-trust" experts, while on the other hand, others tend to "over-trust" them. As we will see in what follows, neither situation is ultimately helpful.

Perhaps all of this seems obvious to you, but it is not obvious to everyone. Consider, for example, that it is common to hear people say that members of the public should simply trust the "experts," particularly scientific experts, when it comes to public policy decision-making. And this is done without any appeal to who counts as an expert, or instructions on how to go about identifying one. The idea seems to be that an expert, in any given domain, is qualified not only to convey accurate information to the general public, but also to prescribe, or recommend, actions to that public.

In particular, this kind of appeal to scientific expertise was recently made in many countries around the world during the ongoing COVID-19 pandemic. The sometimes implicit, sometimes explicit, message is that scientific experts represent "the science" and thus are qualified to tell the public not only what is the case, but also what to do with this information.

There are all sorts of problems with this claim, not the least of which is that science is a method that, albeit reliable, is certainly not infallible. Neither does science have an unlimited domain. In short, this kind of increasingly common and widespread appeal to and promotion of the purported epistemic and normative authority of the scientific expert raises several interesting philosophical questions, which I will examine here. First, it begs the question of who counts as a scientific expert. Next, it also raises the issue of whether there is a connection between scientific expertise and epistemic authority, as well as the question of what, if any, connection there is between scientific expertise and normative, or moral, authority, particularly in the domain of public policy.

Here I will make the case that while we do have reason to trust scientific experts to give us accurate scientific information, this (alone) does not qualify these experts to prescribe actions to the general public. Instead, it takes more than scientific expertise to undergird the moral authority to prescribe action outside of the scientific domain.

## Scientific expertise and epistemic authority

Before addressing the question of whether or not scientific experts have either epistemic or normative authority (in virtue of being experts) we first need to know, at least roughly, what an expert is - and this question is far from being a settled one. Here I will adopt a simplified view, building on Goldman (2001), Croce (2019), and Bennett (2020) of what it means to be an expert in a given domain, and then extend this view in order to propose a definition of what it means to be an expert in the public domain in particular.

According to Goldman, we can understand an "expert" to be someone who possesses more accurate information (that is has, someone who has more true beliefs) than most people do in a given domain. On this definition, then, there is a situation of epistemic asymmetry between someone who is an expert and someone who is a non-expert, a distinction which is sometimes known as the novice-expert dichotomy. Thus, a scientific expert on this definition is someone who knows more (or at least has more true beliefs) about some scientific subfield than most people do.

However, some have argued against this view that merely having more true beliefs in a domain is not enough to constitute expertise, suggesting, instead, that we need to add (Croce 2019) to this the requirement that an expert must also understand, and be able to explain, his or her beliefs to others, while citing evidence in their given field that supports these beliefs (Walton 1989). In other words, this added requirement is that the expert must have reasons for their beliefs and be capable of explicating these reasons to non-experts. This seems to be a reasonable requirement to add when we are talking about public experts specifically -that is, when we are talking about experts who are displaying or employing their expertise in the public domain, to an audience of non-experts. On this enhanced definition, then, an expert is someone who is competent in their field, in that they both possess more true beliefs in the area of expertise and are capable of relaying accurate information about their beliefs in that field to others.

However, as some have pointed out, even competency, as described above, is alone not enough for expertise: just because someone is competent, that does not mean that they are reliable, and it is certainly the case that we want this, too, to be true of our experts - or at least of our public experts. Another way of saying this is that we want our public experts to not only be competent but also to be sincere (Bennett 2020). And we want them to be sincere, not simply because sincerity is a nice way for people to be, but because insincerity and unreliability often go hand-in-hand. If someone isn't sincere, the information that they relay is not likely to be reliable.

Given this concern, it seems reasonable to define a public expert as someone who is "epistemically trustworthy" in that they are both competent (that is, they have more true beliefs than a non-expert, and are capable of explaining these beliefs to others) and sincere. This in turn means, to put it simply, that an insincere "expert" really isn't an expert at all.

Having now defined (at least roughly) what it means to be an expert, we can turn to the question of why we ought to care in the first place about who counts as an expert. This is generally agreed to be because we think that there is a relationship between expertise and what is known as *epistemic* authority, where an epistemic authority can be understood to be someone who "can help their interlocutors achieve some epistemic goal in a given domain through their superior knowledge and/or understanding" (Croce 2019). Thus, the idea is that we should care about who the experts are if we have the goal of wanting to improve our own epistemic positions regarding some domain or some given set of particular questions within a domain, and experts are able to give us the information needed to do this – information that we cannot get on our own (in virtue of being nonexperts).

In other words, we care about who the experts are because experts are people that we can learn from. If an expert then is someone who is both competent and sincere, and we are interested in identifying who these people are in order to gain more knowledge, then we (obviously) need to know how to identify people who are competent in their fields and also sincere.

While this is not always easy to do, generally speaking, most people agree that indirect criteria such as degrees, track records, consensus statements, etc. are reasonable (but not infallible) as proxy for assessing this criterion. For the most part, these indirect criteria are determined by the peers of the potential expert. That is, for instance,

in the case of scientific expertise, we necessarily rely on other scientists to assess the standing of their peers as experts. And although it is imperfect (as are all forms of peer review), this system is generally agreed to be better than alternatives (Gallo et. al. 2016). After assessing (as well as possible) the competence of a potential expert, it is then of equal importance to assess their sincerity, given that it is well known that some "experts" can be disingenuous, or worse.

For example, early in the COVID-19 pandemic "many health experts, including the surgeon general of the United States, told the public simultaneously that masks weren't necessary for protecting the health of the general public and that health care workers needed the dwindling supply" of masks in order to stay safe (Tufecki 2020). Then, just a few months later, and in the absence of any new data, the same health officials announced that masks were essential for everyone to wear in public settings in order to decrease the transmission rate of the SARS-CoV-2 virus. This change in policy did not reflect any change in the science - there was no new data or new experimental information of any kind that became available in the interim between the time that the two messages were conveyed. Instead, the two messages were simply contradictory-either masks work (to some degree of efficacy) to protect people from the virus or they do not.

And yet, this contradictory messaging was clearly and regularly conveyed to the American public during the early days of the pandemic. What happened subsequently, when the non-expert public saw straight through the (ridiculously) contradictory messaging, was that there was a public outcry from a subsection of the population who used it as proof that the "experts" – across the board- were not to be trusted. Or, perhaps worse, that there really is no such thing as an expert at all.

But these kinds of views are, ultimately, untenable- no one can be competent in every domain, and thus it is imperative that we both be able to identify, and rely upon, genuine experts to inform us about topics and issues that we do not ourselves have expertise in. This does not mean, of course, that we ought to put "blind" trust in anyone, experts included, instead, what it means is that we need to be able to identify experts who are both competent and sincere, and thereby likely to be reliable. And this is the reason why only

competent, trustworthy individuals should be counted as experts.

# Scientific expertise and epistemic uncertainty

We have now defined a genuine expert as someone who is both knowledgeable in their field and credible, but this of course does not mean that they are thereby infallible. This is due to the fact that, in addition to all humans always being fallible, all scientific inquiry and all scientific data is also uncertain as well. In other words, as we have already seen, this means that some level of uncertainty is always present in every area of scientific inquiry from epidemiology to climate science to physics. And while no one really likes this fact – and we all wish that we could do away with scientific uncertainty entirely, this does not mean that science is a flawed method or that we cannot, eventually, aptly apply its results to our policies.

But of course, scientific uncertainty is neither easy to deal with, nor likely to ever be completely removed, even with continued advancements in knowledge and instrumentation. It seems that the best thing that we can do, then, is learn how to deal with, and how to communicate, this uncertainty. The first step in this process, after recognizing that uncertainty exists, is to ensure that the uncertainty in question isn't hidden by researchers, but instead is acknowledged, and communicated, both to other scientists, as well as to the public, to policy makers and to other stakeholders more generally. Communicating scientific results to the public, especially when there is a high level of uncertainty, however, is often easier said than done.

Yet, open acknowledgement and communication of scientific uncertainty is the best way to handle it, because when uncertainty is not acknowledged and/or is improperly communicated, this can backfire: hiding the truth from "the public" serves to eventually only foster distrust of the "the experts." So, as Tufecki (2020) argues, it's better to simply tell people the "full painful truth," because trust is more likely to be fostered (and policies to be followed) when people recognize that they are being treated with respect. Of course, scientists are often aware of uncertainty in their research results, but are yet not able to quantify this uncertainty precisely – that is, the probability estimates of the level of uncertainty in any given data set are themselves often uncertain (Stanford 2007). This too can create problems when

communicating scientific results to the public – particularly when the public might demand to know how "certain we are about being uncertain."

Scientific uncertainty, then, should not be understood as an epistemic state of complete lack of knowledge, but instead as a state in which the knower possesses knowledge to a certain degree. Indeed, this epistemic position applies not only to scientific knowledge specifically, but to all knowledge derived from inductive reasoning. Logically speaking, there are two main types of reasoning: deductive and inductive. All scientific knowledge is derived from this latter type of reasoning, which means that, even *in principle*, scientific reasoning does not ever give us 100 percent certainty, because it is not deductive in nature.

But, of course, this does not mean that scientific reasoning is unreliable (as history shows us, quite the contrary is the case!) or that scientific uncertainty is inherently controversial. Instead, it simply means that we need to be aware of the fact that scientific reasoning always yields results with some level of uncertainty and that this should be openly acknowledged and communicated by scientists, to the public and to stakeholders generally.

# Scientific expertise and moral authority

Once we are able to identify who counts as a scientific expert (keeping in mind that no expert is ever infallible and that scientific results are never 100 percent certain) then we can be reasonably assured that they will be able to inform us about what is the case, given some domain or some domain-specific set of questions. In other words, we can be reasonably certain that they will provide us with accurate information. However, scientific experts are not able, simply in virtue of being experts, to tell us what to do with the information that they provide. The reason for this is because moral action lies outside of the domain of science, by design, and therefore must always be supplemented with and informed by extrascientific information and/or values.

This is not to say that these sorts of extrascientific values do not factor into the methodology of science in the first place; they certainly do. It is also not to say that science itself, even before it is applied, either is, or should be, value free. Further, this intertwining of fact and value in science has practical application for citizens in a liberal democracy: so, while we can trust expert testimony to be helpful in forming reliable beliefs, more is needed in order to prescribe actions – particularly those actions which fall outside of the domain of science. This is because science cannot dictate policy, it can only inform it.

However, it should be noted that this *informing* of public policy is an incredibly important role for science, and should not be down-played in any way. In fact, the collective actions that we take (or don't take) based on scientific findings have, in many cases, real and lasting impact on both local and global communities. Thus, science plays a vital and indispensable role in policy formation, in that it can tell us what is the case, however, in order to *apply* science we must appeal to concepts that lie outside of it. As Cowley (2012) puts the point, "All scientists are answerable to a singular realm of discoverable facts. But the same facts may well have different moral significance for different individuals." This is an especially important point to understand in the context of a liberal democracy in which a multiplicity of values is often represented, and it should encourage us to adopt a pluralistic framework for the weighing of these values.

The important point, though, is that the application of social and ethical concepts and values is always going to be necessary when using science to inform public policy. While this might be disconcerting to some who hope for an entirely dispassionate way to decide policy, in the end this is neither desirable nor possible. Because there is no such thing as value-free science (in either methodology or application), many have argued that scientific experts who act in the role of policy advisors should make the extra-scientific concepts and values on which they base their judgments transparent to the public (Douglas 2009, Elliott 2019). Doing this, according to Douglas and Elliott, will help to maintain the integrity of science while also allowing for democratic accountability in policy making.

Of course, making values explicit will increase public trust in science *only if* those values are *democratically decided* ones, rather than ones simply held personally by the scientists conducting the research (in which case these "values" would look, to the public, much more like preferences or biases, rather than anything more helpful).

But given this caveat, making extra-scientific values explicit allows them to be publicly discussed and evaluated and this can in turn both help agency officials make better informed decisions and help to foster public trust in those decisions. It can also help to keep scientific experts accountable, and allow for the public to weigh in on the application of values to policy recommendations.

However, there are also some potential dangers in making these extra-scientific values transparent. Yet, proponents of transparency have argued that these kinds of difficulties can be alleviated by clear and careful communication (Elliott and Resnik 2014, Stanev, 2017, Pinto and Hicks 2019).

What all of this means is that it is vital first, for experts to make their value judgments explicit, as well as available to public examination and second, that it is important for the public to ask the question of when, and how, we ought to supplement scientific information with other, non-scientific considerations and values when applying scientific results to public policy. This is because when "public policy claims to follow the science, citizens are asked not just to believe what they are told, but to follow expert recommendations" (Bennett 2020) - and the only way to evaluate the rightness/wrongness or aptness/inaptness of a prescribed action is to appeal to human values.

This in turn means that if "we are to ask the public to trust the recommendations of scientists, we must acknowledge that this is different from asking novices to accept facts" (Bennett 2020). When we are asking the public to accept a recommendation from an expert, we are asking those persons to "believe that the expert bases their recommendation on values that are held by the recipient of the recommendation," because recommendations do not simply "fall out" of the data alone. In other words, when are asking the public to accept an expert's recommendation regarding an action, we are asking for a particular kind of trust in the expert – not simply trust that the expert is competent and sincere, but "also that their recommendations are in our interest" (Bennett 2020).

Consider an analogy from clinical medicine that helps to illustrate this point. Imagine that a physician (whom we might reasonably describe as a medical expert, assuming that they are both competent and sincere) advises their patient to have a certain surgery. In order to weigh whether or not to have the surgery, it is likely not enough for the patient to know that the physician is an expert (that is, that the physician is competent in their field and sincere). Instead, the patient will very likely also want to weigh whether or not, all things considered, the surgery is in *their own* personal best interest. And this is something that only the patient can decide (perhaps with the help of the physician's input), because it depends upon the patient's personal values and goals, etc.

This situation is similar to that of expert-informed policy decisions in the context of a liberal democracy. While we certainly do want to have the input of experts, we also want to avoid an erosion of democratic decision-making by allowing experts to make our decisions for us. In other words, some have argued regarding this concern that "there appears to be a tension between two demands – that public policies be empirically responsible and that they be democratically legitimate." The worry arises in part because a "decision that follows or is based on science does not entail a good decision or one that is better than what could be decided using something other than science" (Anderson 2011).

Further, because scientific experts are not elected (as policy makers generally are) they are not held accountable to the population they inform or to the values that that population holds. Thus, policy (in a democracy) must be informed by democratically held values – because there simply is no such thing as either science or policy that is void of value judgment. And this is not a bad thing. Instead, what this means is that appeals to science can and should be made when making policy decisions. However, it should also be recognized (and publicly admitted) that scientific data alone cannot dictate policy – human values, and in a democratic society, democratically decided ones – must also inform these decisions.

## Conclusion

The question of scientific expertise, and, in particular, that of who counts as an "expert" is closely connected to the issue of science communication. Here I have attempted to show that determining what it means to be an "expert," and in particular a scientific expert, in the public arena, matters in another way, because there is a relationship between scientific expertise and what is known as epistemic authority. What this means

is that scientific experts, even though they are not infallible, nor are they immune to the constraints of scientific uncertainty, are able, in virtue of their expertise, to convey information that allows non-experts, including members of the general public as well as other stakeholders, to improve their epistemic understanding in a given domain, and thereby to inform public policy decisions in relevant ways. I have also proposed that a scientific expert is someone who is both competent in their field *and* is trustworthy, or sincere, regarding the information they convey. This means that any "expert" who is not sincere is not, on this view, an expert at all.

Finally, I have also argued that although we ought to trust scientific experts because we can learn from them what is the case, and thereby increase our knowledge base by consulting them, scientific expertise alone is not enough to tell us how we ought to act. In order to know how to act on scientific information – even accurate information that is derived from experts- we must appeal to social, political and moral values: there is no way around this (nor would we want there to be), and thus there is no such thing as simply "following the science." Science is a method, albeit a reliable one, but it is neither a tour guide, nor a simple prescription for action. In order to decide how to act we must appeal to human values, and these necessarily lie outside of the domain of science\*.

\*The arguments in this article are further developed in my 2023 Routledge book *Science* and *Public Policy: A Philosophical Introduction* 

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# **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**.

#### # HPS&ST in Latin America

On August 9-11 2023 the Federal University of Rio Grande do Sul (Porto Alegre – Brazil) held the Fifth Latin America IHPST Meeting. 157 participants from all over Latin America attended.

Invited lectures were given by: Prof. Dr. Thomás Haddad (University of São Paulo - USP), who spoke about the history of science and its relations with post-colonialism and the sociopolitics. Prof. Dr. Johanna Camacho González (Universidad de Chile), presented reflections on relationships between feminism, science and science teaching. In addition to the invited lectures, the conference also featured a round table and a special session for basic education teachers.

At the round table, professors Dr. Leonardo Galli (U. de Buenos Aires), Dr. Zuraya Nasr (Universidad Nacional Autónoma de México) and Dr. Andreia Guerra (Federal Center for Technological Education - CEFET/RJ) discussed paths possible for research in History and Philosophy of Science from the perspective of Education.

At a special session, Prof. Dr. Cristiano Moura (Simon Fraser University) led discussions with participants about the challenges encountered in the implementation of historical-philosophical approaches by basic education teachers.

Four courses were given that dealt with various topics about history, philosophy, sociology and science teaching: philosophy of quantum mechanics and the double slit experiment; critical perspectives on the history, philosophy and sociology of science in basic education; contextualized scientific education based on games and narratives historical, and; questions about the historiography of sciences.

Further, 129 works were presented in the formats of oral communications and symposiums, which presented different proposals, strategies and themes at different levels and modalities.

The proceedings of IHPST-LA may be found at <a href="https://www.ufrgs.br/ihpstla2023/anais-do-ihpst-2023/">https://www.ufrgs.br/ihpstla2023/anais-do-ihpst-2023/</a>

If you have 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 <a href="here">here</a> or secondly Michael Matthews here.

## # HPS&ST in Asia

2023 International Chemistry Olympiad: Vietnam won 3 gold medals, 1 silver medal, and ranked the third among the entire delegations HERE

Vietnam achieved excellent results in the 2023 International Physics Olympiad HERE

The Japanese Cabinet approves the Basic Plan for the Promotion of Education (2023-2027)
<a href="https://doi.org/10.2023-2027">HERE</a>

South Korea: "TOUCH" teachers change the way they teach in the classroom and lead digitally-driven innovation

**HERE** 

Malaysia World Renewable Energy Congress (WREC) XXII 2023 HERE

Multi-department cooperation, science and education together improve the scientific literacy for primary and secondary school teachers

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 (Zehjiang Normal University) HERE or Michael Matthews HERE.

#### # Varia

- Vale Stephen Gaukroger (1952-2023)
- Vale Evelyn Fox Keller (1936-2023)
- HPS&ST books, downloadable files **HERE**
- Science & Education Open Access articles (124) **HERE**
- 'Cultural Studies in Science Education: A philosophical Appraisal' (Michael R. Matthews) <u>Cultures of Science</u> journal (Vol.6 No.2, June 2023). Available HERE
- The Paradoxes of Religion and Science in the USA, Jared Diamond, Carol Bakhos & Alex Joyce-Johnson. Available <u>HERE</u>
- Journal thematic issues on science education for global sustainability: Science & Education (HERE), Science Education (HERE), Journal of Research in Science Teaching (HERE), Studies in Science Education (HERE).
- Jeffry L. Ramsey book on *Sustainability and* the Philosophy of Science <u>HERE</u>
- Jerry Coyne on the widening debate about Mātauranga Māori (Māori Science) in New Zealand schools and universities <u>HERE</u>.

Previous HPSST Newsletter contributions to the NZ debate can be read HERE and HERE.

#### # Recent HPS&ST Research Articles

- Arão, J., Leite, L. & Nhalevilo, E. (2023).

  Mozambican Preservice Chemistry Teachers'
  Performance when Analysing Textbook
  Analogies About the Atom. *Sci & Educ*, 1-26.
  https://doi.org/10.1007/s11191-023-00473-0
- Collins, H. (2023). Science as a counter to the erosion of truth in society. *Synthese*, 1.23. https://doi.org/10.1007/s11229-023-04357-2
- Dimopoulou, G., Gasparatou, R. (2023). Dewey and Rousseau on Experience-Based Science Education. *Sci & Educ*, 1-13. https://doi.org/10.1007/s11191-023-00477-w
- Fontes, D.T.M., Rodrigues, A.M. (2023). Science Education Collaboration Network: The Case of the Cultural-Historical Activity Theory. *Sci & Educ*, 1-21. <a href="https://doi.org/10.1007/s11191-023-00479-8">https://doi.org/10.1007/s11191-023-00479-8</a>
- Jiang, Z., Wei, B. (2023). Understanding Science Identity Development Among College Students: A Systematic Literature Review. *Sci*

- & Educ, 1-28. https://doi.org/10.1007/s11191-023-00478-9
- Menon, T., Stegenga, J. (2023). Sisyphean science: Why value freedom is worth pursuing. *Euro Jrnl Phil Sci*, 1-24. https://doi.org/10.1007/s13194-023-00552-7
- Montuschi, E., & Bedessem, B. (2023).

  Understanding What in Public Understanding of Science. *Perspectives on Science*, 1–23. <a href="https://doi.org/10.1162/posc\_a\_00603">https://doi.org/10.1162/posc\_a\_00603</a>
- Nicotra, L. (2023). The Italian Neo-Idealists and Federigo Enriques: The Dispute Between Benedetto Croce and Federigo Enriques: a Defeat for Enriques?. *Substantia*, 7(2), 57–82. <a href="https://doi.org/10.36253/Substantia-2177">https://doi.org/10.36253/Substantia-2177</a>
- Oldofredi, A. (2023). Orthodox or dissident? The evolution of Bohm's ontological reflections in the 1950s. *EPJ H*, 1-24 <a href="https://doi.org/10.1140/epjh/s13129-023-00062-3">https://doi.org/10.1140/epjh/s13129-023-00062-3</a>
- Setlik, J., da Silva, H.C. (2023). A Case Study on Text Formats in Undergraduate Physics Courses: Focus on a Professor's Voice. *Sci & Educ*, 1-23. <a href="https://doi.org/10.1007/s11191-023-00476-x">https://doi.org/10.1007/s11191-023-00476-x</a>
- Su, R., Jiang, Z. & Wei,B.(2023). Representations of Nature of Science in Science Textbooks: A Systematic Review. *Sci & Educ*, 1-23. https://doi.org/10.1007/s11191-023-00475-y

## # Recent HPS&ST Related Books

Baldassarri, F. (Ed.) (2023). *Plants in 16th and* 17th Century: Botany between Medicine and Science. Berlin: De Gruyter. ISBN: 9783110739664. <a href="https://doi.org/10.1515/9783110739930">https://doi.org/10.1515/9783110739930</a>

"In the pre-modern times, while medicine was still relying on classical authorities on herbal remedies, a new engagement with the plant world emerged. This volume follows intertwined strands in the study of plants, examining newly introduced species that captured physicians' curiosity, expanded their therapeutic arsenal, and challenged their longheld medical theories. The development of herbaria, the creation of botanical gardens, and the inspection of plants contributed to a new understanding of the vegetal world. Increased attention to plants led to account for their therapeutic virtues, to test and produce new

drugs, to recognize the physical properties of plants, and to develop a new plant science and medicine." (From the Publisher)

# More information **HERE**

Baldassarri, F. (Ed.) (2023). *Descartes and Medicine: Problems, Responses and Survival of a Cartesian Discipline*. Turnhout, Belgium: Brepols. ISBN: 978-2-503-59461-3

"This volume provides a more exhaustive interpretation of René Descartes' medical views and its reception in the seventeenth century. Filling the gap in the recent scholarship, the contributions in the volume follow four axes: exegetical, textual, philosophical, and contextual. Authors in this book deal with Descartes' physiology, anatomy, and therapy by reconstructing Cartesian texts, detailing possible medical and philosophical sources, discussing medical collaborations and oppositions, and exploring obscurities and failures in Descartes' medicine.

"In laying bare the more promising issues of Cartesian programme and discussing the reception and opposition in the seventeenth century, the volume also uncovers the limitations within his interpretation, ultimately revealing a more nuanced application of his methodology to a field of natural philosophy. While medical studies play a not secondary role in Descartes' entire work, the volume aims to discuss in detail the importance of medicine as a suitable field to understand Cartesian philosophy from a significant perspective in seventeenth-century Europe." (From the Publisher)

# More information **HERE**

Baldassarri, F. & Martin, C. (Eds.) (2023). Andrea Cesalpino and Renaissance Aristotelianism:
Natural Philosophy in the Sixteenth Century.
London, UK: Bloomsbury. ISBN:
9781350325142

"Shedding new light on the understudied Italian Renaissance scholar, Andrea Cesalpino, and the diverse fields he wrote on, this volume covers the multiple traditions that characterize his complex natural philosophy and medical theories, taking in epistemology, demonology, mineralogy, and botany.

"By moving beyond the established influence of Aristotle's texts on his work, *Andrea Cesalpino and Renaissance Aristotelianism* reflects the rich influences of Platonism, alchemy, Galenism, and Hippocratic ideas. Cesalpino's relation to the new sciences of the 16th century are traced through his direct influences, on cosmology, botany, and medicine. In combining Cesalpino's reception of these traditions alongside his connections to early modern science, this book provides a vital case study of Renaissance Aristotelianism." (From the Publisher)

## More information **HERE**

Ball, Philip (2023). *How Life Works: A User's Guide to the New Biology*. Chicago, IL: The University of Chicago Press. ISBN: 9780226826684

"Biology is undergoing a quiet but profound transformation. Several aspects of the standard picture of how life works—the idea of the genome as a blueprint, of genes as instructions for building an organism, of proteins as precisely tailored molecular machines, of cells as entities with fixed identities, and more—have been exposed as incomplete, misleading, or wrong.

"In *How Life Works*, Philip Ball explores the new biology, revealing life to be a far richer, more ingenious affair than we had guessed. Ball explains that there is no unique place to look for an answer to this question: life is a system of many levels—genes, proteins, cells, tissues, and body modules such as the immune system and the nervous system—each with its own rules and principles. *How Life Works* explains how these levels operate, interface, and work together (most of the time).

"With this knowledge come new possibilities. Today we can redesign and reconfigure living systems, tissues, and organisms. We can reprogram cells, for instance, to carry out new tasks and grow into structures not seen in the natural world. As we discover the conditions that dictate the forms into which cells organize

themselves, our ability to guide and select the outcomes becomes ever more extraordinary. Some researchers believe that ultimately we will be able to regenerate limbs and organs, and perhaps even create new life forms that evolution has never imagined.

"Incorporating the latest research and insights, *How Life Works* is a sweeping journey into this new frontier of the life sciences, a realm that will reshape our understanding of life as we know it." (From the Publisher)

## More information HERE

Bashford, A., Kern, E., & Bobbette, A. (Eds.) (2023) New Earth Histories: Geo-Cosmologies and the Making of the Modern World. Chicago, IL: The University of Chicago Press. ISBN: 9780226828602

"This book brings the history of the geosciences and world cosmologies together, exploring many traditions, including Chinese, Pacific, Islamic, South and Southeast Asian conceptions of the earth's origin and makeup. Together the chapters ask: How have different ideas about the sacred, animate, and earthly changed modern environmental sciences? How have different world traditions understood human and geological origins? How does the inclusion of multiple cosmologies change the meaning of the Anthropocene and the global climate crisis? By carefully examining these questions, New Earth Histories sets an ambitious agenda for how we think about the earth.

"The chapters consider debates about the age and structure of the earth, how humans and earth systems interact, and how empire has been conceived in multiple traditions. The methods the authors deploy are diverse—from cultural history and visual and material studies to ethnography, geography, and Indigenous studies—and the effect is to highlight how earth knowledge emerged from historically specific situations. *New Earth Histories* provides both a framework for studying science at a global scale and fascinating examples to educate as well as inspire future work. Essential reading for students and scholars of earth science history, environmental

humanities, history of science and religion, and science and empire." (From the Publisher) More information HERE

Gonçalves, Bernardo (2023). *The Turing Test Argument*. Abingdon, UK. Routledge. ISBN: 9781032291574

"This book departs from existing accounts of Turing's imitation game and test by placing Turing's proposal in its historical, social, and cultural context.

"The book reconstructs a controversy in England, 1946-1952, over the cognitive capabilities of digital computers, which led Turing to propose his test. It argues that the Turing test is best understood not as a practical experiment, but as a thought experiment in the modern scientific tradition of Galileo. The logic of the Turing test argument is reconstructed from the rhetoric of Turing's irony and wit. Turing believed that learning machines should be understood as a new kind of species, and their thinking as different from human thinking and yet capable of imitating it. He thought that the possibilities of the machines he envisioned were not utopian dreams. And yet he hoped that they would rival and surpass chauvinists and intellectuals who sacrifice independent thinking to maintain their power. These would be transformed into ordinary people, as work once considered 'intellectual' would be transformed into nonintellectual, 'mechanical' work.

"The Turing Test Argument will appeal to scholars and students in the sciences and humanities, and all those interested in Turing's vision of the future of intelligent machines in society." (From the Publisher)

## More information HERE

Levy, N. (2023). *Philosophy, Bullshit, and Peer Review* (Elements in Epistemology).
Cambridge: Cambridge University Press.
ISBN: 9781009256315 [Open Access]

"Peer review is supposed to ensure that published work, in philosophy and in other disciplines, meets high standards of rigor and interest. But many people fear that it no longer is fit to play this role. This Element examines some of their concerns. It uses evidence that critics of peer review sometimes cite to show its failures, as well as empirical literature on the reception of bullshit, to advance positive claims about how the assessment of scholarly work is appropriately influenced by features of the context in which it appears: for example, by readers' knowledge of authorship or of publication venue. Reader attitude makes an appropriate and sometimes decisive difference to perceptions of argument quality. This Element finishes by considering the difference that author attitudes to their own arguments can appropriately make to their reception. This title is also available as Open Access on Cambridge Core." (From the Publisher)

# More information **HERE**

May, Joshua (2023). *Neuroethics: Agency in the Age of Brain Science*. Oxford, UK: Oxford University Press. ISBN: 9780197648087

"What ethical questions does neuroscience raise and help to answer? *Neuroethics* blends philosophical analysis with modern brain science to address central questions within this growing field:

- · Is free will an illusion?
- Does brain stimulation impair a patient's autonomy?
- Does having a mental disorder excuse bad behavior?
- · Is addiction a brain disease?
- Should we trust our gut feelings in ethics and politics?
- Should we alter our brains to become better people?
- · Is human reasoning bound to be biased by our values?
- Can brain science be trusted to read the minds of criminals and consumers?

"This book provides an opinionated tour through captivating cases and a close examination of the philosophical issues and scientific evidence. Joshua May's lively and accessible writing style makes it an indispensable resource for students and scholars in both the sciences and humanities." (From the Publisher)

# More information HERE

Nieto-Galan, A. (2023). The Land of the Hunger Artists: Science, Spectacle and Authority, c.1880–1922. Cambridge: Cambridge University Press. ISBN: 9781009379540

"From the 1880s to the 1920s, hunger artists professional fasters - lived on the fringes of public spectacle and academic experiment. Agustí Nieto-Galan presents the history of this phenomenon as popular urban spectacle and subject of scientific study, showing how hunger artists acted as mediators between the human and the social body. Doctors, journalists, impresarios, artists, and others used them to reinforce their different philosophical views, scientific schools, political ideologies, cultural values, and professional interests. The hunger artists generated heated debates on objectivity and medical pluralism, and fierce struggles over authority, recognition, and prestige. Set on the fringes of the freak show culture of the nineteenth century and the scientific study of physiology laboratories, Nieto-Galan explores the story of the public exhibition of hunger, emaciated bodies, and their enormous impact on the public sphere of their time." (From the Publisher)

# More information HERE

Sojka, Maria M. (2023). A Heated Debate: Meta-Theoretical Studies on Current Climate Research and Public Understanding of Science. New York, NY: Columbia University Press. ISBN: 9783837665802

"Ever since climate change has been identified as one of the most significant challenges of humanity, climate change deniers have repeatedly tried to discredit the work of scientists. To show how these processes work, Maria M. Sojka examines three ideals about how science should operate. These ideals concern the understanding of uncertainties, the relationship between models and data, and the role of values in science. Their widespread presence in the public understanding of science makes it easy for political and industrial

stakeholders to undermine inconvenient research. To address this issue, Sojka analyses the importance of tacit knowledge in scientific practice and the question of what defines an expert." (From the Publisher)

# More information **HERE**

Sudmann, A. et al. (Eds.) (2023). *Beyond Quantity: Research with Subsymbolic AI*. New
York, NY: Columbia University Press. ISBN:
9783837667660

"How do artificial neural networks and other forms of artificial intelligence interfere with methods and practices in the sciences? Which interdisciplinary epistemological challenges arise when we think about the use of AI beyond its dependency on big data? Not only the natural sciences, but also the social sciences and the humanities seem to be increasingly affected by current approaches of subsymbolic AI, which masters problems of quality (fuzziness, uncertainty) in a hitherto unknown way. But what are the conditions, implications, and effects of these (potential) epistemic transformations and how must research on AI be configured to address them adequately?" (From the Publisher)

#### More information HERE

Webster, Colin (2023). *Tools and the Organism: Technology and the Body in Ancient Greek and Roman Medicine*. Chicago, IL: The University of Chicago Press. ISBN: 9780226828770

"Medicine is itself a type of technology, involving therapeutic tools and substances, and so one can write the history of medicine as the application of different technologies to the human body. In Tools and the Organism, Colin Webster argues that, throughout antiquity, these tools were crucial to broader theoretical shifts. Notions changed about what type of object a body is, what substances constitute its essential nature, and how its parts interact. By following these changes and taking the question of technology into the heart of Greek and Roman medicine, Webster reveals how the body was first conceptualized as an "organism"—a functional object whose inner parts were tools, or organa, that each completed certain vital tasks. He also shows how different medical tools created different bodies.

"Webster's approach provides both an overarching survey of the ways that technologies impacted notions of corporeality and corporeal behaviors and, at the same time, stays attentive to the specific material details of ancient tools and how they informed assumptions about somatic structures, substances, and inner processes. For example, by turning to developments in water-delivery technologies and pneumatic tools, we see how these changing material realities altered theories of the vascular system and respiration across Classical antiquity. Tools and the Organism makes the compelling case for why telling the history of ancient Greco-Roman medical theories, from the Hippocratics to Galen, should pay close attention to the question of technology." (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 (<a href="mailto:paulo.asterix@gmail.com">paulo.asterix@gmail.com</a>) 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

# **# Coming HPS&ST Related Conferences**

November 29-December 2, 2023, 9<sup>th</sup> 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** 

March 17-20, 2024, NARST Annual Conference, Denver CO

Details **HERE** 

May 16-18, 2024, Society for Philosophy of Science in Practice (SPSP) Tenth Biennial Conference, University of South Carolina, Columbia, SC USA Details <u>HERE</u>

June 13-15, 2024, XXXI Baltic Conference on the History and Philosophy of Science, Tartu Details Anu Rae (anu.rae@ut.ee)

June 26-28, 2024, Singapore National Institute of Education, STEM conference Details **HERE** 

August 1-8, 2024, 25th World Congress of Philosophy, Rome Details <u>HERE</u>

September 4-7, 2024, 11<sup>th</sup> European Society for History of Science conference, Barcelona Details **HERE** 

# # HPS&ST Related Organisations and Websites

IUHPST – International Union of History, Philosophy, Science, and Technology

DLMPST – Division of Logic, Mathematics, Philosophy, Science, and Technology

DHST – Division of History, Science, and Technology

<u>IHPST</u> – International History, Philosophy, and Science Teaching Group

<u>NARST</u> - National Association for Research in Science Teaching

**ESERA** - European Science Education

Research Association

ASERA - Australasian Science Education

Research Association

<u>ICASE</u> - International Council of Associations for Science Education

**UNESCO** – Education

- 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

<u>GWMT</u> - Gesellschaft für Geschichte der Wissenschaften, der Medizin und der Technik

<u>ISHEASTME</u> – 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 ScienceEPSA - European Philosophy of Science

Association

<u>AAHPSSS</u> - 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 AssociationBAHPS - 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

<u>ISHPSB</u> - 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

#### # HPS&ST NEWSLETTER PERSONNEL

Editor Assistant Editor (Publications & Website Regional Assistant Editor (North America) Michael Matthews
Paulo Maurício
Sophia Jeong

Regional Assistant Editor (Latin America) Regional Assistant Editor (Asia) **Nathan Lima** 

**Huang Xiao** 

# # Assistant Editors (Latin America and Europe) Required

After three years of valuable service to the HPS&ST community, Nathan Lima (Federal University of Rio Grande do Sul, Porto Alegre, Brazil) is needing to step down from his Assistant Editor (Latin America) duties. A replacement is required and will be most welcomed. At the same time, after a pause of a few years, an Assistant Editor (Europe) is also required.

The basic duty involves preparing a 'HPS&ST in Latin America/Europe' item for the monthly newsletter. The items carry news of Latin American and European HPS and Science Education activities, conferences, publications and research programmes. Being able to identify and invite scholars for newsletter Opinion Piece essays is especially welcomed. The newsletter brings these Latin American and European endeavours to a wide international audience. Anyone interested in the positions should contact the editor, Michael Matthews. Please attach a brief biographical statement along with some elaboration of interest in the position, experience, background, connections to HPS and/or science education, and the names and emails of one or more folk who could be approached for references.