Integrated History and Philosophy of Science

Durham, 10–11 July 2023

Programme and Participant Information

Welcome!

A warm welcome to Durham! We are pleased to host you for the 2023 iHPS conference and extend our thanks for helping us make it a rewarding and stimulating event. We were impressed by the range of the submissions we received and by the evident connections among them, and we look forward to the conversations to come.

In addition to the conference programme, this packet contains some practical information about the conference venue and the immediate environment.

We hope you enjoy your time in Durham. If we can be of assistance as you plan your trip, please reach out.

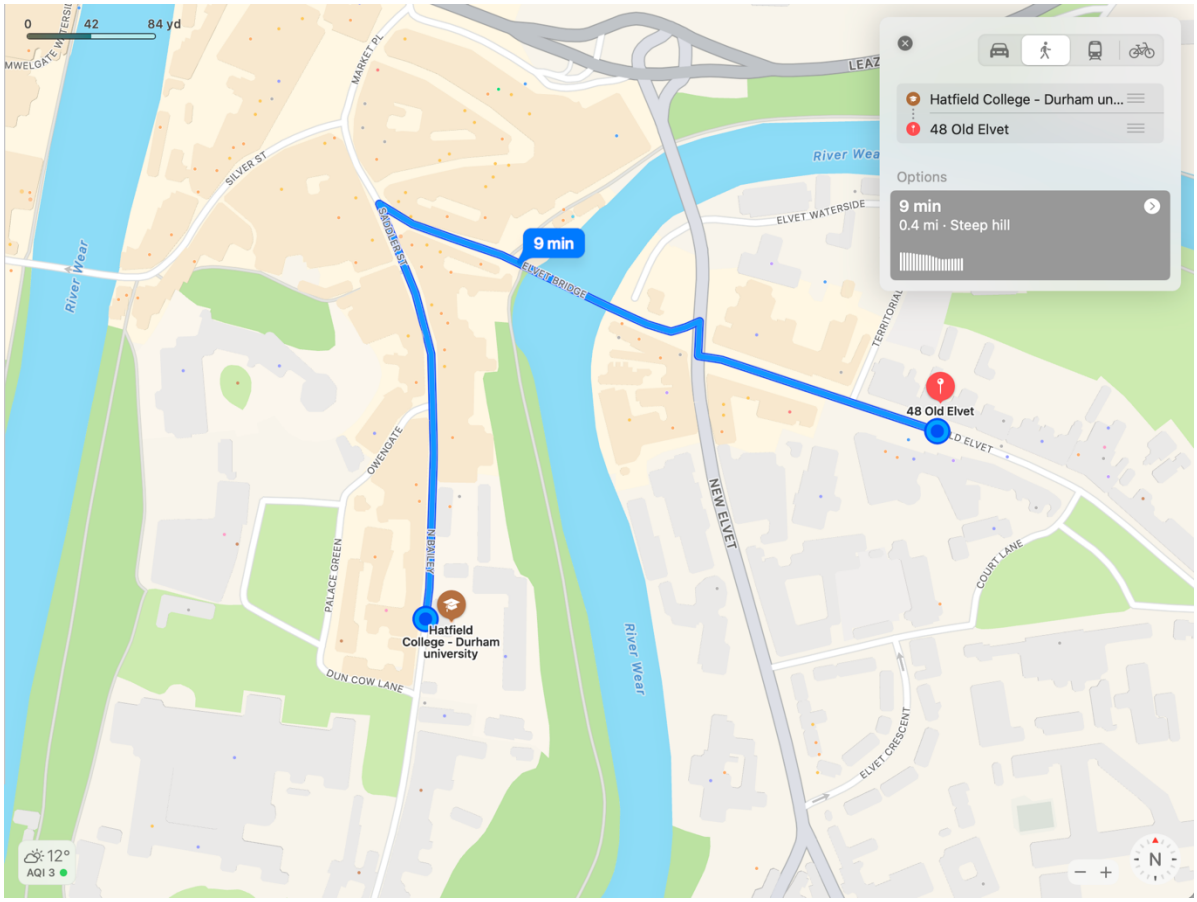
—The Organising Committee (Cat Gillen, Joe Martin, Peter Vickers, and Sarah Wieten)

Practicalities

Conference Location
We will meet in the Birley Room, Hatfield College on July 10 and in rooms 004 and 005 of the Philosophy Department, in 48 Old Elvet on July 11.

To get to Hatfield College, follow Saddler Street from Market Square uphill toward the Cathedral. Hatfield will be on your left, after the History Department (which is 43 North Bailey). Enter the college through the main gates, take a right after the tennis court and follow signs to the Birley Room. The college porters can guide you if you encounter trouble.

Rooms 004 and 005 of the Philosophy Department can be accessed via the front door to 48 Old Elvet. The map below shows the two locations relative to each other.



Format
Each speaker has a 30-minute slot. Speakers are asked to speak for no more than 20 minutes, allowing at least 10 minutes for questions. Rooms are equipped with A/V equipment. We encourage speakers to send any visuals to the panel chair in advance.

Accommodation
Durham is compact, and numerous hotels and B&Bs are available near the centre, including:

- Kingslodge Inn: https://www.inncollectiongroup.com/kingslodge-inn/
- Hotel Indigo: https://durham.hotelindigo.com/
- Delta Marriott: https://www.marriott.com/en-us/hotels/ncldd-delta-hotels-durham-royal-county/overview/
- Premier Inn: https://www.premierinn.com/gb/en/hotels/england/county-durham/durham/durham-city-centre-walkergate.html
- Raddison Blu: https://www.radissonhotels.com/en-us/hotels/radisson-blu-durham
- OYO: https://www.oyorooms.com/gb/
- Inexpensive college accommodation is sometimes available through: https://www.universityrooms.com/en-GB/city/durham/home/

Food and Drink
We will provide tea, coffee, and a light lunch on each of the conference days, but we recommend the following local establishments to meet your other dining needs:

Restaurants

- Barrio Comida – 34 Church St – Probably the best tacos in Britain
- Turkish Kitchen – 66 Saddler St – Sit-down spot for meze and hearty meals
- The Rabbit Hole – 17 Hallgarth St – Sit-down spot for well-considered Asian fusion
- Brooklyn Slice – 3 North Rd – A quick, fresh, pizza-by-the-slice option
- The Picnic Basket – 7 New Elvet – Freshly made sandwiches and toasties to go

Cafes

- Collected – 44 Riverwalk – Café bookshop specialising in women authors; opens 8 a.m.
- Flat White Kitchen – 40 Saddler St/21A Elvet Bridge – Mainstay coffee shop (2 outlets)
- Chapters Tea Room – 16 Elvet Bridge – All-round coffee, tea, breakfast, and lunch spot
- Vennels – 71 Saddler St – A hidden favourite for baked goods and basic lunches
- Cafédral – Owengate – Justly renowned for its scones

Pubs and Bars

- The Victoria – 86 Hallgarth St – Traditional pub with a maze of cosy rooms
- Kingslodge Inn – Waddington St – Quiet, spacious venue
- Station House – North Road and Station Approach – Camra-endorsed ale/cider pub
- The Half Moon Inn – 86 New Elvet – Large riverside beer garden
- 33 Durham – 33 Neville St – Craft cocktails and a speakeasy vibe
- The Dun Cow – 37 Old Elvet – Philosophy Department local
- The Shakespeare – 63 Saddler St – History Department local

Acknowledgments
Generous support from the British Society for the History of Science, British Society for the Philosophy of Science, and the Durham University Department of Philosophy, Department of History, and Centre for Global Understanding of Environment, Science, and Technology, and the Centre for Humanities Engaging Science and Society made iHPS Durham possible.

PROGRAMME

July 10 Birley Room, Hatfield College

10.30–11.00 Welcome (Coffee/Tea/Refreshments)

11.00–12.30 Intellectual Humility (Chair: Peter Vickers)

11.00–11.30 **Tom Rossetter (Durham University)**
The Influence of Social Roles on Intellectual Humility in Science: The Case of Chemical Water Analysis in Nineteenth-Century London

11.30–12.00 **John Shepherd (Durham University)**
Humble Probabilities and Hubristic Judgements? Predicting Criminal Behaviour in the United States, c. 1930–1960

12.00–12.30 **Emily Webster (Durham University)**
Empire vs. Microbe: Bacteriological Stances and Epistemic Humility in the Belfast and Dublin Typhoid Epidemics, 1880–1910

12.30–14.00 Lunch

14.00–15.30 History of Philosophy of Science (Chair: Joe Martin)

14.00–14.30 **David Chandler (University College London)**
'"Halt, so geht das nicht!": *Wittgenstein's Influence on Feyerabend's Philosophical Development*

14.30–15.00 **Noah Friedman-Biglin (San José State University)**
An Apology for Analytic Philosophy: The Left Vienna Circle in Postwar American Academia

15.00–15.30 **Caterina Sisti (University of Turin)**
Ravens & Strawberries: Remarks on Hempel's and Ramsey's Accounts of Laws and Scientific Explanation

15.30–16.00 Break

16.00–17.30 Meta-HPS (Chair: Cat Gillen)

16.00–16.30 **Jouni-Matti Kuukannen (University of Oulu)**
Kuhn, Progress and Knowing-How: An Epistemological-Functional Account of Scientific Progress

16.30–17.00 **Ute Deichmann (Ben-Gurion University)**
On the Usefulness of Kuhn's Concept of Scientific Revolution in Understanding the History of Biology

17.00–17.30 **Isadora Cristina de Sousa Monteiro (University of Lisbon)**
After All, What Exactly Is the History and Philosophy of Science?

July 11 PO-004, 48 Old Elvet (Philosophy Department)

9.00–10.30 HPS Perspectives on Medicine (Chair: Cat Gillen)

9.00–9.30 **Pradipto Roy (Copenhagen University)**
Unmaking 'Mental Health' in South Asia through Epistemic Explorations

9.30–10.00 **Nick Summerton (Durham University)**
Methodological Problems in Retrospective Diagnosis: The Case of the Roman Emperor Augustus

10.00–10.30 **Binjie Zou (Cambridge University)**
Scientific Communication: Rational Distrust?

10.30–11.00 Break

11.00–12.30 HPS Perspectives on the Human Sciences (Chair: Sarah Wieten)

11.00–11.30 **Roger Smith (Independent Scholar)**
The Science of a Bodily Sense: History and Philosophy of Kinaesthesia

11.30–12.00 **Ian James Kidd (University of Nottingham)**
Anthropology, Misanthropy, and Moral Progress

12.00–12.30 **Riana Betzler (San José State University)**
The Evidential Basis of Psychotherapy: Expansive and Tacit

12.30–14.00 Lunch

14.00–15.30 HPS Perspectives on Biology (Chair: Sarah Wieten)

14.00–14.30 **Boglarka Kiss (University of Exeter)**
Experimental Systems and Epistemic Loss: The Role of Bacterial Transformation in Genetics and Evolutionary Biology

14.30–15.00 **Uzma Malik (Durham University)**
'Local Unification' Understanding: What It Is and Why We Want It

15.00–16.00 Break

16.00–17.00 HPS Perspectives on Race (Chair: Cat Gillen)

16.00–16.30 **Noa Sophie Kohler (Ben-Gurion University)**
A Debate Between Two Liberal Scholars on How to Approach Physical Anthropology in 19th Century Germany, and the Question of Race

16.30–17.00 **Alexander Douglas (BIMM University Manchester)**
Pain and b/Black Identity: Race in Medicine

July 11 PO-005, 48 Old Elvet (Philosophy Department)

9.00–10.30 HPS Perspectives on Visual Culture (Chair: Peter Vickers)

9.00–9.30 **Chiara Ambrosio (University College London) and Grant Fisher (KAIST)**
Abstracting as Manipulating Aspectual Structure: Jane Richardson's Ribbon Drawings

9.30–10.00 **Anatolii Kozlov (University College London)**
Scientific Representations: A Question of Style

10.00–10.30 **Zhuohan Yang (University College London**
A Review of Computer Graphical Approach to Represent the Fourth Dimension

10.30–11.00 Break

11.00–12.30 HPS Perspectives on Classical Physics (Chair: Tom Rossetter)

11.00–11.30 **Nicholas M. Danne (Independent Researcher)**
Fresnel's Laws: Historical Representation vs. Semirealist Metaphysics

11.30–12.00 **Yuan Tao (Max Planck Institute for the History of Science)**
Imagery of Air Motion and the Theory of Sound in Manuel de Góis and Rodrigo de Arriaga

12.00–12.30 **Tzuchien Tho (University of Bristol)**
Lagrange's 'True Metaphysics' and the Foundations of Analytical Mechanics

12.30–14.00 Lunch

14.00–15.30 HPS Perspectives on Modern Physics (Chair: Joe Martin)

14.00–14.30 **James Fraser (University of Wuppertal)**
Down with Time-Evolution Equations: The Long S-Matrix Programme

14.30–15.00 **I. Ufuk Tasdan (University of Bristol)**
Time Reversal Symmetry in Modern Physics

15.00–15.30 **Beñat Monfort Urkizu (University of the Basque Country)**
Meta-Empirical Assessment in the Early Universe Scenario: The Viability of Cosmic Inflation

15.30–16.00 Break

16.00–17.00 Discipline and Method (Chair: Joe Martin)

16.00–16.30 **Joseph Gough (Durham University)**
How Do Scientific and Medical Disciplines Get Their Subject-Matters?

16.30–17.00 **George Borg (National Science Foundation/University of Pennsylvania)**
What Makes the Historical Sciences Tick? Geochronology and the Ontology of Scientific Methods

Abstracts

Chiara Ambrosio (University College London) and Grant Fisher (KAIST)
Abstracting as Manipulating Aspectual Structure: Jane Richardson's Ribbon Drawings

First published in 1981 in a landmark paper titled 'The Anatomy and Taxonomy of Protein Structure' Jane Richardson's famous ribbon drawings of proteins remain only marginally discussed in historical and philosophical accounts of protein research (Strasser 2019; Fisher 2017; Ambrosio forthcoming). Originally based on molecular patterns produced through X-ray crystallography, Richardson's drawings departed from the complexity of earlier atomic models, and followed instead her insight that pattern similarities among protein structures can be due to folding preferences. At a time of taxonomical confusion in the field, they answered the important question of whether proteins exhibit any regularities in their structures. As Richardson herself noted, 'making a drawing can change one's scientific understanding of a protein, sometimes revealing a preferable classification' (Richardson 2000, 624). We propose a sustained and systematic historical and philosophical study of Richardson's drawing practice and explore how her design choices crucially hinged on abstracting as a means of manipulating 'aspectual structure' (Lopes 1996; Fisher 2017) for the purpose of classifying proteins. We will show that judgments about what to represent and what to omit from the drawings allowed Richardson to approach protein structure dynamically and selectively, in line with her insight that the process of drawing can result in a change of understanding. For Richardson, we will argue, the practice of abstracting fulfilled a twofold purpose: to group proteins into classes according to their structures, and to provide a visual method that would make judgments about salient structural features evident, communicable, and ultimately usable by the scientific community.

Riana Betzler (San José State University)
The Evidential Basis of Psychotherapy: Expansive and Tacit

This paper traces a shift in the humanist psychotherapist Carl Rogers' thinking about what it means to take a scientific approach to establishing psychotherapeutic effectiveness.

Rogers' Person-Centered approach sees psychotherapy as a process whereby therapists, through empathic engagement with clients, facilitate 'constructive personality change'. In the 1950s Rogers sought to emulate the hard sciences and obtain objective evidence for the efficacy of this form of psychotherapy. His method for gathering such evidence involved articulating clear if-then hypotheses, formulating measurement scales to test these hypotheses, and running controlled trials. After attending a conference with philosophers of science Michael Polanyi and Jacob Bronowski, Rogers came to question these methods. I argue that this occasioned his development of a more expansive view of scientific psychotherapy. This expansive view attempted to resolve tensions between generalization and individuality, subjectivity and objectivity, and the art and science of therapeutic practice.

Rogers navigated these tensions by assimilating Polanyi's ideas about the tacit dimension of scientific knowledge into his thinking about psychotherapy. Rogers' work highlights an ongoing controversy about the 'active ingredient' in psychotherapy: Is it the therapeutic relationship that enables healing? Or the specific practices and techniques the therapist employs? Incorporating the tacit dimension shows how these two elements are in dynamic interplay; the skilled therapist deploys the techniques of psychotherapy in flexible and attuned

ways. Considering the tacit dimension also helps us to understand a little-considered form of evidence about efficacy: the therapist's sense that psychotherapy is 'working'.

George Borg (National Science Foundation/University of Pennsylvania)
What Makes the Historical Sciences Tick? Geochronology and the Ontology of Scientific Methods

There has been increasing philosophical interest in the role of technological progress in the historical sciences. Geochronology is the field of geology devoted to the measurement of geologic time. It experienced an explosion of its research boundaries in the 20th century. I explain this productivity by analyzing the ontology implicit in geochronological techniques. The immediate object of inquiry of geochronological measurement is not the geological age, but the 'apparent age' of a sample. This concept is not intrinsic to the geological domain, but to the measurement method, which is based on the law of radioactive decay and mass spectrometry. The concept allowed the measurement of geologic time to be detached from specific geologic processes. Its application presupposes a technologically mediated, mereological decomposition of geologic samples into their constituent elements and isotopes.

The spectacular success of isotope geochronology was not due merely to the contingent discovery of radioactivity. Three, more general, features can be identified: (i) mereological decomposition in order to (ii) exploit regularities at lower ontological levels, and (iii) an exceptional complementarity between the instrument and those regularities, allowing application to a plethora of geological contexts. I call the strategy represented by (i) and (ii) 'level-switching.' The bifurcation between the apparent age and the geological age reflects the ontological shift.

This analysis introduces a further dimension in our understanding of the methodology of the historical sciences. Information destruction over time is a major problem in the latter. Level-switching was useful in geochronology because the lower level was less subject to information destruction than the higher level, a pay-off that, I argue, is intrinsic to the ontological approach.

David Chandler (University College London)
'Halt, so geht das nicht!': *Wittgenstein and Feyerabend*

My primary aim in this paper is to make out the historical significance of Wittgenstein's influence on the philosophical development of Feyerabend. With this in mind, our discussion is intentionally restricted to the brief period of 1948 to 1952: beginning with the former's lectures to the 'Kraft Circle' and ending with the latter's presentation of his thoughts to some prominent Wittgensteinians in Oxford. Namely, I want to understand the sway of these intervening events on some of the earlier ideas present within Feyerabend's philosophy of science, especially concrete research and scientific change. My suggestion is that such an investigation should continue per the following outline. I will attempt to correctly place the formation of the Kraft Circle within the philosophical landscape of the time. By making clear their assignment to consider philosophical problems, albeit, in a non-metaphysical way concerning contemporary findings in the natural sciences, we can establish the intellectual atmosphere that acted as the background to Wittgenstein's lecture to the group in late 1950. In doing so, we can also uncover the connection between Feyerabend and Anscombe, not only

because it was the latter who suggested that Wittgenstein be invited to speak but as a first step in the former's relationship with the Philosophical Investigations through his reading of several transcripts shared with him during his time in Vienna. I will extend these comments to both Feyerabend's studies at the London School of Economics under Popper and his subsequent presentation of his research to the aforementioned collection of individuals.

Nicholas M. Danne (Independent Scholar)
How the History of Optics Undermines Semirealist Optics

Anjan Chakravartty proposes a 'semirealism' about theoretical entities, whereby the dispositional properties detected in science manifest real structures describable by scientific laws. Purported advantages of the view include its principled distinction between 'detection' properties that survive paradigm shifts, and 'auxiliary' properties (and entities) that do not. In this talk, I problematize the optical disposition elaborated in Chakravartty's fundamental discussions of semirealism: the optical intensity that manifests as Fresnel's laws of refraction. Impressive to many is the porting of Fresnel's laws between pre- and post-Maxwellian conceptions of electromagnetism, motivating realism about the wave theory of light. I contend that such motivation goes decisively too far, once the semirealist commits to ascribing real optical dispositions like intensity. For while Fresnel's laws and optical property ascriptions literally apply at only a given wavelength, Fresnel recognized and disclaimed in his prize-winning memoir that no light in nature propagates at one wavelength. Rather, finite-duration pulses of light propagate as envelopes of spectral frequencies—no finite-duration component of which can propagate at a single frequency, on pain of physical and conceptual regress. Thus, I generate for the semirealist a dilemma: either intensity cannot be a detection property, because its monochromatic manifestation never actually occurs, or intensity cannot be a real *disposition*, because monochromatic manifestations are infinitely durative by (mathematical-physical) definition, and because no such *eternal* structure is plausibly the manifestation of any property *disposed* to respond to stimuli. History suggests that Fresnel's insight supports generalizations about refractive phenomena better than ascriptions of real optical properties.

Ute Deichmann (Ben-Gurion University)
On the Usefulness of Kuhn's Concept of Scientific Revolution in Understanding the History of Biology

Kuhn's *Structure of Scientific Revolutions* was reported to be the 20th century book most frequently cited between 1976 and 1983 in the Arts and Humanities, appreciated for discrediting the previous ahistorical, prescriptive approach to the philosophy of science. However, the concepts of scientific revolution and incommensurability were also strongly criticized by philosophers as being too radical. An informed criticism was made by physicist-turned-philosopher Michael Polanyi, who had anticipated Kuhn's concepts of 'normal science' and 'incommensurability,' but did not agree with his distinction between normal science aimed at puzzle solving and scientific revolutions changing whole scientific frameworks. Relating mainly to examples from the history of physics, he showed that revolutionary ideas were often generated out of 'normal science' and that incommensurability, the logical gap between scientists working in different frameworks and 'speaking in different languages,' could be resolved in the course of scientific progress, an idea that Kuhn rejected.

Focusing on the history of biology, I will show that periods of major innovations, such as those following the establishment of the chromosome theory of heredity, did not meet Kuhn's categories of scientific revolutions. They were not 'sudden, unstructured events'; they had a rational basis—the new paradigms were superior in scope and explanatory power, and the scientific principles were, in most cases, not incommensurable with the previous ones. I will show, moreover, that biological research has mostly advanced by opening up new fields of research that co-existed with the existing ones, and by integrating previously separated fields.

Alexander Douglas (BIMM University Manchester)
Pain and b/Black Identity: Race in Medicine

This paper explores the question of 'physical' pain as it is experienced by b/Black people in the Anglophone world and beyond.

In the history of psychiatry, racial injustice has been predominantly approached through ideas of risk, violence and compulsion. And much of the psychiatry-centred work in critical medical humanities has focussed on either (a) ideas of 'intergenerational trauma' (instead of the more quotidian 'pain') or (b) concepts of danger, violence and risk as opposed to subjective experiences of and structural responses to pain. As a 'symptom', in and of itself pain cannot be apprehended by empirical means; its presence can be inferred by empirical investigation, but otherwise it is a matter of testimony. Consequently, it is more easily theorised/abstracted than understood. Even where it is self-consciously accepted that b/Black minds are not inferior to white, b/Black bodies are frequently taken to be structurally-physiologically 'other' (in relation to white bodies); a state of affairs with an extraordinary impact on both the experience of health and healthcare within b/Black communities.

Building on work such as Harriet Washington's *Medical Apartheid* (2007), which lays out historical structures of racism in medicine, and work by Atkinson et al (2010) and Viney et al (2015) that foregrounds the importance of the 'critical', this paper will offer some new ideas through a bespoke 'iHPSM' lens – using ideas from b/Black philosophers including Achille Mbembe, Paul Taylor and Quayshawn Spencer – for how we approach race in medicine through the issue of pain and pain management.

James Fraser (University of Wuppertal)
Down with Time-Evolution Equations: The Long S-Matrix Programme

Time-evolution equations are often treated as paradigm examples of laws of nature, yet in high energy physics there is a long history of attempts to eliminate such equations from physics. I make a case for recognising a continuous tradition of these attempts going back to Heisenberg's S-matrix theory of the 1940s. Believing the divergence difficulties facing quantum field theory to stem from the use of a differential time-evolution equation, Heisenberg put forward an alternative dynamical framework based on imposing conditions on the so-called scattering S-matrix. Contrary to standard historical narratives, this idea was not swept aside by the success of renormalised quantum electrodynamics. In fact, it remained extremely influential in the post-war period. I argue that many poorly understood developments in the 1950s and 60s, such as causal perturbation theory, axiomatic quantum field theory, dispersion relations, and the bootstrap programme can be understood as direct continuations of Heisenberg's original

concept. Intriguingly, these various continuations can all be understood as adding a causality condition to Heisenberg's original cast of principles, though causality was formalised and interpreted quite differently in each. While the dream of completely eliminating time evolution equations from physics never came to fruition it never completely died either. Arguably this historical strand continues to influence many areas of contemporary theoretical physics. I conclude by considering what this might mean for philosophical theories of principles and laws of nature.

Noah Friedman-Biglin (San José State University)
An Apology for Analytic Philosophy: The Left Vienna Circle in Postwar American Academia

In its heyday, the Vienna Circle's Logical Positivism was a movement which married philosophical research to a mission of active societal reform. As fascism rose in Europe the environment in Vienna became hostile to their movement; it was not lost on the fascist governments that Logical Positivism was allied with left-wing projects.

Several Circle members immigrated to the USA where they had an immense impact on the shape of American academia. Though some of the members of the Circle continued their work in their adopted country, the movement never regained its crusading spirit. It transformed, first into Logical Empiricism, then into the more generic Analytic Philosophy, becoming a methodology safely quarantined in academic philosophy, far from influencing the society of post-war America.

But, I argue that some of Circle members never lost their ambition that the philosophical movement they were involved in would have far ranging societal consequences – that it would have political outcomes. Focusing on Carnap, I show that the tack he took in debates about logic and ontology were driven by a platform of ideals he articulated in the Circle's manifesto and still held post-war. Finally, I argue that the reason the political ambitions of Carnap's work are little-known in philosophy today stem from the political environment in 1950s academia, and the hostility to left-wing projects at that time. On my view, he made a conscious effort to downplay political aspects of the Circle's project to avoid scrutiny by the American government, motivated by his experience with fascism in Europe.

Joseph Gough (Durham University)
How Do Scientific and Medical Disciplines Get Their Subject-Matters?

Many boundary disputes in science, medicine, and philosophy involve appeals to the subject-matters of scientific and medical disciplines, where these subject-matters are taken as fixed and knowable. This is tied to a *prima facie* plausible view of different branches of science and medicine, whereby some kind of decision is made about what class of things they deal with, and then the disciplines' practitioners aim to work out how best to study or treat that class of things (e.g., Ramsey, 2017). I believe that for at least some scientific and medical disciplines, this view is mistaken. While scientific and medical disciplines may start off assigned with a domain of pretheoretic interest, a set of paradigm cases of interest, or an initial remit, this rarely remains fixed.

Scientific and medical disciplines also tend to be driven by practical concerns and theoretical questions. As time passes, these concerns and questions shift and are recast. They also acquire

techniques and methods; as these techniques and methods accrue and are applied, new phenomena may turn out to be amenable to the techniques characteristic of a given discipline or branch of medicine. The set of phenomena studied or treated by disciplines within science and medicine often appear to change over time as a result of a complex interaction between theoretical and practical goals, methods and their applicability, and the current remit of the area (eg, Gough, 2022). I argue that this is so by considering several recent examples from science and medicine.

Ian James Kidd (University of Nottingham)
Anthropology, Misanthropy, and Moral Progress

This talk explores the uses and abuses of several of the human sciences – anthropology and psychology, especially – in debates about the moral condition of humankind. Many optimistic authors have appealed to those sciences to encourage positive accounts of the moral history, condition, and future development of humankind. Steven Pinker and Rutger Bregman are two influential examples. Critics from several historical sciences accuse them of epistemic failings: self-serving oversimplifications, omission of counter-evidence, unwarranted inferential leaps, presenting assumptions as facts, and conceptual unclarity. I agree on that, but argue that the failings must be understood as symptoms of an untenable conception of science, one whose defects are best articulated through the lens of integrated history and philosophy of science. The defective philosophy of science has three main features: (a) a failure to appreciate that normative judgments do not just pop out of (allegedly) neutral scientific facts, (b) a failure to grasp the morally problematic dimensions of scientific knowledge and its applications, and (c) an outdated conception of science as a triumphal, rational, progressive enterprise. None of these—independently or collectively—withstand philosophical or historical scrutiny. If that's right, then underlying some high-profile cases of (allegedly) scientifically-based optimism about the moral condition and future of humankind is bad philosophy of science.

Boglarka Kiss (University of Exeter)
Experimental Systems and Epistemic Loss: The Role of Bacterial Transformation in Genetics and Evolutionary Biology

This paper attends to Frederick Griffith's experiments on pneumococcal transformation, which are regarded as an important milestone in the identification of DNA as the substance of heredity. Griffith's work is also understood to be the first laboratory experiment which traced horizontal gene transfer in bacteria, a process which is now recognised as playing a fundamental part in microbial evolution, and is taken to put pressure on our understanding of the 'tree of life'. In most biological, historical and philosophical accounts, Griffith's work is discussed as a significant precursor to Oswald Avery's experiments which demonstrated the role of DNA in heredity. While it took fewer than ten years for Avery's findings to be accepted by geneticists, the recognition that horizontal modes of genetic transfer play a significant role in bacterial evolution only started to emerge four decades after Griffith's experiments. Even more strikingly, Griffith's contribution to the development of these insights was only acknowledged explicitly at the end of the 1980s and during the early 1990s. I will discuss the history of Griffith's experiments in terms of epistemic loss, that is, while his results' relevance for genetics *vis-à-vis* DNA was acknowledged, its relevance for horizontal gene transfer was not. I

will show how Griffith's experiments were relevant to both genetics and evolutionary biology, and will offer an explanation for the experiments' differential uptake in these fields by building on Rheinberger's theory of experimental systems.

Noa Sophie Kohler (Ben-Gurion University)

A Debate Between Two Liberal Scholars on How to Approach Physical Anthropology in 19th Century Germany, and The Question of Race

This paper gives insight into the formation process of German physical anthropology, and its methodological standards for researching race. I will focus on a scholarly, public exchange of opinions between two researchers: the famous physician and liberal statesman Rudolf Virchow, and Ludwig Stieda, a Baltic German anatomist at Dorpat (Tartu) University. Virchow was one of the founders of anthropology as a scientific field and is credited by historians with keeping it liberal by criticizing Teutonic/Nordic race theories, and by speaking out against Antisemitism. In 1876, based on craniometric literature and comparisons, he published 'On Some Skull Characteristics of Lower Human Races' in which he argued (broadly speaking) against the notion that certain skull features of 'lower human races' were pithecoid – opposing the idea of ascent from lower to higher races, with the lower human races directly related to the highest mammalian genera. Stieda published a highly critical review of it in the top-tiered anthropological journal *Archiv für Anthropologie*, criticizing that the skull measurements used by Virchow could not be compared with one another and thus the scientific method was not precise enough. He believed better standardized measurement methods were needed before any statements on race could be made. This, in turn, elicited a reply from Virchow.

I use this largely forgotten controversy to discuss the objectives and demarcations of race research within the framework of liberal physical anthropology.

Anatolii Kozlov (University College London)

Scientific Representations: A Question of Style

When different scientific models represent the same target, it is said that they may be representing in different epistemic styles. One way to classify different representational styles is to classify the necessary and sufficient conditions that ground their representational status. Such is the strategy proposed by, for example, Frigg and Nguyen (2017). The issue, however, is that most current accounts of scientific representations (inferential, artefactual, DEKI, fictional; all except morphism accounts) take a pragmatic stance on scientific representations. They link the epistemic function of representations to their capacity to afford inferential ('surrogative') reasoning about the target of representation. In this work, I put forward the affordances-based notion of style. As I intend to show, it allows us to import the notions of style developed in the philosophy of art. As an example, I consider the notion of style as it appears in the work of Ernst Gombrich. Gombrich's rendering of style is underpinned by its mimetic problem-solving orientation and by the existence of representational traditions. I show that these two aspects help to forge some useful links between the style of scientific representations and more historically oriented notions of styles of reasoning (Hacking) and styles as canons of aesthetic values (McAllister). Using the case from X-ray crystallography, I specifically show that the evolution of protein representations, on the one hand, partially

accords with McAllister's aesthetic induction model, and, on the other, is best described by Gombrichs' idea of representing as creating a sensory illusion.

Jouni-Matti Kuukkanen (University of Oulu)
Kuhn, Progress and Knowing-How: An Epistemological-Functional Account of Scientific Progress

Kuhn famously rejects that science progresses towards a uniquely true account of the mind-independent world. Yet he states that science progresses. Progress comes down to improved problem-solving. It is important to realize that Kuhn talks about the progress of scientific *knowledge*. This raises the question of in what sense exactly problem-solving is knowledge. This paper then has two main goals. The first is to explain Kuhn's account of problem-solving as *growth in knowledge* by redefining knowledge as knowledge-how instead of knowledge-that. In my analysis, I will draw on Kuhn's so far unpublished Foerster lecture 'Does Knowledge Grow?' Further, by linking the discourse of scientific progress to recent epistemological debates, I argue that knowledge-how ought to be understood as an ability, and therefore, scientific progress as an improved ability to solve problems and accomplish other tasks of scientific practice. The second goal of this paper is to assess this notion of progress in relation to the recent debate on the nature of scientific progress, which has been reinvigorated by Bird's (2007) paper. It will be shown that the epistemological and functional accounts of progress are, in fact, compatible if only the classical definition of knowledge is replaced by its understanding as knowledge-how. This results in a new, epistemological-functional conception of scientific progress.

Uzma Malik (Durham University)
'Local Unification' Understanding: What It Is and Why We Want It

This paper will use R A Fisher's 1930 model showing the ubiquity of the one-to-one sex ratio in diverse biological populations to illustrate the power and scope of a theory of understanding I am developing: 'Local Unification' (LU). LU is a generalisation of the 2009 Batterman's 'minimal model explanation', but freed from the language of physics in which Batterman characterises minimal models so that they can apply widely. I choose this particular historical example because Batterman himself (in a 2014 paper with Rice) suggests that it is a minimal model explanation but does not properly show how.

I aim not just to illustrate Local Unification but to show what is special about it. I began this work by asking 'Just what kind of understanding is it that we can get from minimal models?' They seem to fit neither of the two standard accounts, local causal understanding and global unificationist understanding. As I develop it, an LU model provides the best of both worlds, uniting these two in an integrated way. Sorin Bangu 2017 aims to provides such a hybrid theory, but I claim he does not succeed because his theory is essentially global. LU overcomes this problem by weaving into Bangu's global account features from Michael Strevens 2004/8 local difference-making account. I will show just how Local Unification provides these two different valuable kinds of understanding in an integrated way in Fisher's sex-ratio explanation.

Isadora Cristina de Sousa Monteiro (University of Lisbon)
After All, What Exactly Is the History and Philosophy of Science?

This paper will revisit the literature about the History and Philosophy of Science as a discipline, from the 1920s to the present day. Revisiting a selection of some of the main texts that discuss the nature of the relationship between the History and the Philosophy of Science, we intend to find a definition of what is or can be an integrated HPS. Despite the existence of HPS departments, conferences, and journals, the union of HS with PS and the consolidation of their working methodologies present several difficulties. Thus, in this paper, we aim to establish guidelines for the pursuit of research in HPS as a discipline that seeks to study science from a point of view that integrates History and Philosophy.

Thomas Rossetter (Durham University)

The Influence of Social Roles on Intellectual Humility in Science: The Case of Chemical Water Analysis in Nineteenth-Century London

Nineteenth-century chemistry provides an illuminating case for investigating the influence of social roles on intellectual humility. Chemistry during this period was undergoing a process of professionalisation and was becoming increasingly applied to practical concerns that had arisen in the wake of industrialisation and urbanisation. As a result, chemists found themselves performing new social roles, and these roles had a significant impact on their scientific conduct. In this talk, I investigate the influence of social roles on intellectual humility in chemistry by examining the different roles played by chemists in the controversy over potable water in nineteenth-century London. In this debate, chemistry was seen as the main arbiter of water purity and chemists were employed as analysts by both interested parties and government bodies. Chemists conducting analysis for government bodies exhibited greater intellectual humility than those working for interested parties. Specifically, they were more cognisant of the limits of chemical analysis and had a greater appreciation for insights into water safety from other fields such as epidemiology, microscopy, and bacteriology. This, I argue, is because of their greater degree of independence and because they had less incentive to promote chemistry as uniquely equipped to deal with the problem of water purity.

Pradipto Roy (University of Copenhagen)

Unmaking 'Mental Health' in South Asia through Epistemic Explorations

Biomedical psychiatry got consolidated and emerged as the mainstay/central framework of institutional mental health care across the world by early twentieth century, albeit not as a universal discipline. Critiques stem soon from within and outside the speciality, cross-cultural psychiatry being perhaps the lasting and most meaningful impact of so. Yet, long before the medical anthropological turn in the West, local nuances, realities and ideas seem to modify the general biomedical paradigms and operate on a socio-culturally congruent local version of the general discipline. Notwithstanding so, the scientistic zeal and empirical emphasis of the Western biomedical discipline seem to have prevailed over local practices in the postcolonial decades. Historical discourses in madness in colonial south Asia have largely been restricted to institutional histories of psychiatry, madhouses and lunatic asylums receiving quite a thorough attention. Twentieth-century developments in psychoanalysis-alike psych-disciplines have also been studied in detail, often with references to their shared epistemology with Indian philosophy. Psychological symptoms, however, did receive wide attention in popular medical space at least since late-nineteenth century, going beyond walls of lunatic asylums and largely

differing from later developments in psychoanalytic-philosophic perspectives. Contextualizing discourses in vernacular health periodicals from colonial Bengal, this paper argues that, rather than campaigning for any specialised regime, popular Indian practitioners harped significantly on contingent ideas in subcontinent's heterotopic mental healthcare space of plural orderings, which helped shaping of a distinctive mental health culture in India in subsequent days. Through select case studies, this paper charts the intertwined history and philosophy of mental healthcare in south Asia, and how such interdisciplinary discourses resonate with the mandates of cutting-edge psych research ideas, such as those being promoted by transcultural psychiatry.

John Shepherd (Durham University)

Humble Probabilities and Hubristic Judgements? Predicting Criminal Behaviour in the United States, c. 1930–1960

In the early 20th century United States criminal justice, particularly the sentencing of juvenile offenders, sought judgements based on the likely outcomes of 'treatment' and 're-adjustment'. In turn, however, this required experts and officials to make hubristic, prejudicial claims about an individual's future criminal behaviour. By the 1930s criminologists and the public increasingly feared that neither judicial discretion nor psychiatric expertise could make such predictions, prompting a turn to probabilistic 'predictive instruments'. Criminologists Sheldon and Eleanor Glueck constructed tables of correlated factors by which to score potential criminality and hoped that officials and experts would thence make decisions in humble deference to the 'objective' statistical probabilities they presented. In actuality these prediction tables relied on a variety of hidden presumptions and ultimately served more to codify and legitimise the suspicions of those using them. Moreover, the turn to probability did not change the need for conclusive judgements of individual risk and measures to be enacted. A 'humble' treatment of the probabilities and their intrinsic uncertainty was at odds with the expectations of efficient judgement and administration.

Caterina Sisti (University of Turin)

Ravens & Strawberries: Remarks on Hempel's and Ramsey's Accounts of Laws and Scientific Explanation

In this paper, I draw a comparison between Hempel's and Ramsey's accounts of laws, generalisations and scientific explanation. The comparison highlights the many similarities between the two accounts, as well as a huge difference. I argue that this difference suggests an original diagnosis of Hempel's *raven paradox*, outlining a possible solution.

First, I present Ramsey's late account of laws and generalisations, as introduced in his posthumously published paper *General Propositions and Causality* (1929). Here, Ramsey rejects the Tractarian view of universal generalisations as infinite conjunctions, in favour of a characterisation as 'rules for judging' of sentences like 'all men are mortal'. By means of Ramsey's *strawberry abstainers* example, I clarify his account. Then, I draw the comparison between Hempel's covering-law model of scientific explanation and Ramsey's account of counterfactuals as instances of generalisations: Hempel's *explanandum* can be identified with Ramsey's consequent of a conditional. The similarities are indeed remarkable. However, where Hempel requires his *explanans* to be true (thus including the law), Ramsey believes generalisations not to be propositions at all. In the final part of the paper, I consider the *raven*

paradox, arguing that adopting Ramsey's account of laws prevents the paradox from arising. The non-propositional view of laws identifies as problematic Hempel's formalisation of generalisations as material conditionals, and leads to the non-applicability of Hempel's *Equivalence Condition*. To strengthen this claim, I turn Ramsey's strawberry abstainers example into a raven case. A different, non-classical account of (universal) conditionals can offer a solution and block the paradox.

Roger Smith (Independent Scholar)
The Science of a Bodily Sense: History and Philosophy of Kinaesthesia

The subjective sense of movement, a sense of action-resistance, is central to the feeling of being alive and the feel for reality. Kinaesthesia, the conscious awareness of position, movement, tension and relaxation in muscular parts of the body, is an essential component of this sense. Scientific enquiry into the phenomenon involves investigation of a bodily function and, at the same time, philosophical questions about how, empirically, humans make claims about what is real. This raises questions about the relation between experimental investigation and phenomenology, the objective description of subjective states, questions with a history going back at least to the early 18th century. (I do not discuss the philosophical topic of what is real.) The proposed paper, which draws on published work, will introduce these issues within a European historical framework.

Nick Summerton (Durham University)
Methodological Problems in Retrospective Diagnosis: The Case of the Roman Emperor Augustus

Retrospective diagnosis has been defined as the practice of identifying an illness after the death of a patient based on present-day medical understanding.
However, concerns have been raised about the rigour of the approaches being adopted and the veracity of any outputs. Issues arise from the inappropriate application of modern medical knowledge and current disease classifications, in addition to over-reliance on our contemporary values, attitudes and ideas (Cunningham, 2002; Karenberg, 2009).

The Roman Emperor Augustus was a very important figure in the history of the Western World; but surviving ancient sources paint a picture of an individual troubled by fragile health with episodes of severe illness. Often relying solely on various translations of Suetonius` `*Life of Augustus*`, modern historians and physicians have suggested a range of retrospective diagnoses to account for Augustus` health problems: sunstroke, psychosomatic disorders, liver disease, typhoid and malaria.

This talk will argue that Augustus is a victim of retrospective misdiagnosis. Using Suetonius' *Life of Augustus* as my starting point, I will analyse how this author`s health-related comments might have been misinterpreted by modern readers due to inadequate consideration of contextual and translational variables. I will also seek to evaluate the Augustan medical record provided by Suetonius in relation to other ancient biographical and medical sources.

More broadly this case study will highlight a requirement to create a better process in order to improve the performance of retrospective diagnostic studies.

Yuan Tao (Max Planck Institute for the History of Science)
Imagery of Air Motion and the Theory of Sound in Manuel de Góis and Rodrigo de Arriaga

This paper contributes to the historical epistemology of sound by uncovering a crucial condition that underlies its conception in 17th century Jesuit natural philosophy, namely the pictorial imagination of air motion. Taking as my text the *De anima* commentaries of Manuel de Góis and Rodrigo de Arriaga, I argue that their understanding of sound as a sensible quality goes much deeper than their loyalty to an Aristotelian ontology in which perception is caused by sensible quality, arising from a particular kind of pictorial imagination of air motion similar to the motion of solid bodies and wind. In their imagination, chunks of air move like solid masses that are impenetrable to each other and are perceptible by other sensory faculties when moving with a high speed. This imagery is nurtured in the scientific practice of the Aristotelian philosopher—scientist, who relies on everyday experiences with visible and tangible objects.

Based on this imagery and the assumptions that come with it about what is possible for air motion, Góis and Arriaga rule out air motion as a candidate for the direct cause of hearing and attribute the cause instead to the quality of sound, making use of the Aristotelian concept of secondary quality. This results in an insurmountable difficulty in explaining how air motion and the quality of sound, which is supposed to inhere in the air, relate to one another, since motion has no place in the Aristotelian explanatory framework of sensible quality and its subject of inherence.

I. Ufuk Tasdan (University of Bristol)
Time Reversal Symmetry in Modern Physics

The notion of time reversal symmetry is important in physics and philosophy of physics today because weak interactions present both theoretical and experimental challenges to it, even though time reversal symmetry is a hallmark of these interactions. These challenges include the anomalies in the mass of neutrinos and the difficulty of measurement of 'direct' time reversal. This paper considers cur- rent debates about the representation of time reversal by different transformations in physics. The controversy about how time reversal should be represented focuses on theoretical criteria, such as the invariance of charge, the positivity of the Hamiltonian, the reversal of momentum, the invariance of equation of motions, and invariance of magnetic fields under time reversal transformations.

This paper adopts an integrated history and philosophy of science approach to the issue and so considers the history of physical practice that has so far largely been overlooked both in the philosophy of physics literature and physics textbooks. In fact, experiments (explained in Wu et al. and Christenson et al.) were the primary factor in determining the appropriate type of time reversal transformation. In particular, the rejection of the unitary time reversal operator (and so acceptance of the anti-unitary operator) is linked to experiments involving weak interactions and the preservation of spin-statistics. Notably Pauli (1936), Racah (1937), Lüders (1954), and implicitly by de Breidenbach and Gerlach (1941), Feynman (1949), Bell (1955) and de Breidenbach and Gerlach (1941) are embraced unitary time reversal operation.

Symmetries can be defined in terms of invariance at several levels including solutions, equations of motion, the Lagrangian, the Hamiltonian, and the Action. The Action became particularly significant for understanding time reversal symmetry as a result of developments in relativistic quantum field theory (rQFT). By analyzing the invariant features of symmetry

transformations at the level of Action, which is historically in line with the approach of the founders of the CPT Theorem, we show that both the unitary time reversal operator and the anti-unitary operator plausibly represent time reversal transformation. We criticize theoretical explanations for the choice of time reversal transformation, as our historical approach demonstrates that experimentation motivates the 'right' transformation. Additionally, we argue that how time reversal symmetry is understood depends on the metaphysics employed, and that relativity theory has transformed our understanding of time and hence of time reversal.

Tzuchien Tho (University of Bristol)
Lagrange's 'True Metaphysics' and the Foundations of Analytical Mechanics

Due to WR Hamilton, Lagrangian mechanics is often historically interpreted in a way that highlights the evolution of the least action Principle (or, more accurately stationary action) due to the methods of optimisation. This characterisation is indeed true for the historical developments of analytical mechanics before Lagrange (Maupertuis, Euler, et. al.) and after Lagrange (Hamilton, et. al.) but not true for the mature Lagrange who was very keen to distance his work from teleology. Though there is not scholarly consensus, J.L. Fraser (1983) has made a convincing claim that this rejection of his teleologically inclined elder colleagues was at the basis of his claim of having developed 'the true metaphysics of their [mechanics] principles' [*la vraye metaphisique de leurs principes*]. Yet since Lagrange was typically laconic about 'metaphysics', we do not have a clear expression of what this might concretely be.

This paper focuses on the method of virtual velocities which Lagrange used to replace the least action methods of his predecessors and examine the metaphysics that it could imply. In particular, focus is placed on the causal theory implied by Lagrange's methods and shows how this challenges not only teleological understandings but also the Newtonian mechanical one.

The paper begins by contextualising Lagrange's method of virtual velocities within the periods of his writing focusing on his 1764 work on the Moon's libration. We then move to contextualising these methods within the foundations of analytical mechanics, identifying the theoretical development of virtual velocity and virtual work methods that had come before. By doing this, we develop a sketch of the metaphysical assumptions of the method and use this to assess the deep differences between Lagrange's innovations and the standard understanding of the least (stationary) action principle. We finally make a case for a Lagrangian theory of causation that is local but not mechanical in the usual sense, and structural but not teleological as his near predecessors would have it. The reexamination of the foundations of analytical mechanics will have significant concepts to offer contemporary philosophy of physics.

Beñat Monfort Urkizu (University of the Basque Country)
Meta-Empirical Assessment in the Early Universe Scenario. The Viability of Cosmic Inflation

Meta-Empirical theory Assessment (MEA) argues that, due to the progressive distancing of theory from experiment, the way of evaluating contemporary physical theories has changed: as empirical confirmation became more difficult, physicists developed new methods to recognize which theories are worth pursuing, making it possible to assess theories with little or no empirical basis. In that direction, Richard Dawid tried to catch this new way of assessing

theories of fundamental physics meta-empirically by proposing three methodological arguments. His central idea is that the synergy of these three arguments in support of a theory amounts to a form of meta-empirical confirmation.

In this talk, I shall base myself on this philosophical framework and I will use some insights of historical epistemology to investigate the current status of a fundamental theory in cosmology: Cosmic Inflation. This case study is interesting in this regard because, in spite of the materialization of some of its predictions and its undeniable predominance in the early universe scenario, its viability – as well as its empirical status – continues to be controversial. I will discuss the evolution of the theory itself – from its foundation in the eighties to the 'Cosmic Controversy' that arose from a different interpretation of the Planck satellite results in 2013 – as well as the role of the main actors in the discussion. My central thesis is that MEA plays a legitimate role in theory confirmation in cosmology, but I shall back that Cosmic Inflation is pursuit-worthy rather than meta-empirically confirmed.

Emily Webster (Durham University)

Empire vs. Microbe: Bacteriological Stances and Epistemic Humility in the Belfast and Dublin Typhoid Epidemics, 1880–1910

In 1880, Charles Cameron, Medical Officer of Health for the City of Dublin, was nearly laughed out of a meeting of the British Medical Association for a paper he read entitled 'Typhoid from Oysters.' Despite Cameron's assertion that he had 'no doubt whatever that oysters were very frequently the means of communicating enteric fever', using his home city of Dublin as a case study, the connection between the two would not be widely accepted by the British medical community until nearly twenty-five years – and several shellfish-borne typhoid outbreaks – later. Conversely, in the city of Belfast, a typhoid outbreak in 1907 prompted the Chief Medical Officer of Health for the City, James Lorrain Smith, to search for a causative organism using the standard methods accepted by the British Medical Association – bacteriological and chemical examination of water. However, a Royal Inquiry into the elevated death rates of the city unearthed overwhelming evidence that shellfish contamination was likely driving the outbreak – an epidemiological pathway championed by Dr Darra Mair, a prominent English Medical Officer of Health.

Examining conflicting expert accounts on the causative agents of typhoid fever epidemics in Dublin and Belfast, Ireland, this paper will argue that these stark differences in accepted typhoid epidemiology were not simply a function of time and 'scientific progress', but rather symptomatic of complex metropole-periphery dynamics and power structures inherent in imperial knowledge systems in epidemiological consensus-making on typhoid fever etiology. Looking to debates between Chief Medical Officers of Health and the Medical Experts called in from England to serve on Royal Inquiries into each epidemic, I will consider the role of intellectual humility in the positioning of experts' frames and their decisions to pursue or retract theories of transmission – and its consequences for epidemic control.

Zhuohan Yang (University College London)

A Review of Computer Graphical Approach to Represent the Fourth Dimension

The representation of the fourth dimension has long lied in arts and geometry, but geometer Thomas Banchoff's computer graphical animation of the fourth dimension in 1970s has provided an accurate and vivid method to visualize the fourth dimension unprecedently. Such approach inspires artist Tony Robbin for his works of art and informs the public of the beauty in the fourth dimensional geometrical objects.

The essay explores the use of computer graphics in representing geometrical objects in the fourth dimension, its potential impact on non-mathematicians' understanding of this abstract concept and suggesting new avenues for mathematical research. The essay is based on Steingart's paper A four-dimensional cinema: computer graphics, higher dimensions and the geometrical imagination but further elaborate the idea that geometrical imagination and understanding visualization of the fourth dimension can be comprehended by non-mathematicians without extensive mathematical knowledge.

The essay firstly provides an overview of the fourth dimension in art and Banchoff's animated films, then checks the properties of hypercubes as the fundamental block for experiencing such visualizations. Then the author presents two cases, including computer graphist Gu Yu's interactive online animations and artist Tony Robbin's works, to demonstrate that non-mathematicians can logically and intuitively understand the fourth dimension. Finally, the essay analyses potential enquiries brought to mathematical epistemic virtues by such computer simulations.

Xianglong Zhu (University College London)
Hybrid Objectivity: Benjamin Hobson and the Making of Anatomical Knowledge in Modern China

This article explores the hybrid between Western and Chinese visions of objectivity in the anatomical knowledge of modern China through an examination of Benjamin Hobson's *Quanti xinlun* 全體新論 and his collaboration with Chinese literati. For the Chinese, the Western anatomical knowledge embodied in vivid illustrations is distinct from its Chinese counterpart, as Traditional Chinese Medicine (TCM) takes the human body as a whole rather than treating different parts separately. Inspired by the theory of cultural hybridity, I aim to add a new dimension to Lorraine Daston and Peter Galison's narrative of objectivity by examining how Western objectivity in *Quanti xinlun* was adopted and adapted by Chinese literati in the reconstruction of their understanding of the human body. Focusing on the imbalanced power dynamics between Hobson and his Chinese collaborators in the context of hybrid objectivity, my contention is that Hobson utilised Western standards of objectivity to observe and evaluate the portrayal of the human body in TCM as a means of criticising the perceived archaic nature of TCM. This approach can be seen as a colonial viewpoint that disregards the contextual understanding of objectivity held by Chinese people. Given the long-lasting influence of *Quanti xinlun* in modern China, this paper further argues that it not only introduced a new perspective to diagnose the human body in terms of medical treatment but also allowed Chinese elites to discipline and survey citizens' bodies in name of saving the nation, eventually leading to long-standing anxiety about self-identity.

Binjie Zou (Cambridge University)
Scientific Communication: Rational Distrust?

In this essay, I show that the conventional accounts of the epistemology of expertise break down in the case of vaccine hesitancy in present China. I argue some features of trustworthiness might make no sense in one country, for example, high credence in peer testimony in the UK, but make sense in another, i.e., in China.

This essay has three parts, in part I, I discuss Goldman's model that some features signal a true expert and therefore the trustworthiness of her testimony; in Part II, I examine a case study of vaccine hesitancy in China and I argue in Part III, that the gap between the ideal and the actual public trust in expert/non-expert testimony does not imply the Chinese public is irrational, because the signalling effects of standard features of expertise may be different, and Chinese public may be using the correct features in China given its authoritarian nature. I conclude by providing valid responses to some objections, especially the worry that peer testimony on informal social media is a form of second-hand testimony, i.e., rumours, whose truthfulness is not warranted.

I do this by looking at work that defends the epistemological value of rumours. For example, *Furman (2020)* and *Gelfert (2014)* argue that justifiable to believe in rumours when one has no access to official trustworthy information (i.e., in a dictatorial regime); or when the rumours provide a first encounter with a new piece of information one otherwise could not have accessed.