

# CSHPS/SCHPS 2026 - Halifax

## ABSTRACTS/RÉSUMÉS

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**Abraham, Tara** (University of Guelph)

*Transmitting Psychiatric Knowledge and Skill: Encounters between Students, Patients, and Teachers*

Psychiatry was a contested field in 19th and early 20th-century American medicine. Operating at the periphery of many mainstream medical schools, educational practices for psychiatry often centred on insular, informal apprenticeship in asylums, and the subject barely made an appearance in most medical school curricula before World War I. However, a look beyond the sphere of formal medical education reveals that this period had many students of psychiatric knowledge and skill—what Nikolas Rose calls technologies of judgement, cure, and intervention—and that this group was enormously diverse. Who were psychiatry’s students before it was an established part of the medical school experience? Where did they learn, and who were their patients? What skills were viewed as part of psychiatric teaching and how did such skills evolve? This paper examines encounters between student, patient, and teacher in American psychiatry between the 1880s and 1920s. Focusing on two prominent teachers of psychiatry during this period, Edward Cowles and Adolf Meyer, I interrogate the ways that the social organization of spaces of psychiatric knowledge—lecture halls, clinics, and asylums—shaped pedagogical practices and the knowledge and skills taught to students. Psychiatric attendants—often women—acquired skills in the day-to-day care of patients. Assistants and junior physicians learned therapeutics and basics of running an asylum. As education became more formalized, future superintendents studied protocols for history-taking. Beyond the asylum, students of biology, psychology, and neurology, both inside and outside the medical school, were educated about the biological basis of the abnormal mental life. By examining institutional reports, unpublished lectures, manuals, textbooks, and exchanges between student and instructor, I highlight the ways that diverse clinical spaces and diverse student populations informed a pluralistic psychiatric pedagogy during a formative period in its evolution.

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**Andrews, Derek** (Goethe University Frankfurt am Main)

*Diagnostic Categories, Heterogeneity, and Expertise: Addressing Challenges to the Experience-based-expertise Movement in Mental Health Care*

Proponents of the Experience-based Expertise (ExpEx) movement contend that individuals with mental disorders, owing to their first-person experience with their disorders, should be understood as Experts-by-Experience (Exp) with unique expertise valuable to practices in mental health care; however, the movement faces several practical and conceptual challenges (Dings & Tekin, 2023).

I argue that addressing at least some of these challenges requires recognizing the difference between the objects of expertise of clinicians without first-person experience of mental disorders and Exp. While the expertise of Exp arises from their experience of their particular cases of mental disorders themselves, arguably filtered “through the lens” of diagnostic categories (Dings & Glas, 2020; Tekin, 2014) or medical interpretation (Blume, 2016), the expertise of the clinician issues primarily from knowledge of diagnostic categories, i.e. from idealized conceptions of mental disorders. I further contend that this

difference in “objects of expertise” can be best understood through the lens of a two-part model of the metaphysics of mental disorders (Andrews, 2025), with clinical expertise being based on knowledge of mental disorders as neurobiological phenomena and that of Exp on the subjective experience thereof, i.e. of mental illness.

This implies that the expertise held by Exp is fundamentally different than clinical expertise, suggesting distinct domains of expertise within the practices of mental health care. This distinction, in turn, may help to address challenges in making sense of Exp expertise (Blume, 2016; Dings & Glas, 2020; Tekin, 2014) and those arising from the heterogeneity of mental disorders (Tekin, 2014; Zimmerman et al., 2014), as well as provide direction for responding to practical challenges, such as the adjudication of disagreements between clinicians and Exp (Dings & Tekin, 2023; Posthouwer & Timmer, 2013; Leemeijer & Trappenburg, 2016).

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**Bandini, Aude** (Université de Montréal)

*Type 1 Diabetes as a Shifting Nosological Entity*

From Acute Crisis to Degenerative Process: Evolving Ontologies of Type 1 Diabetes

Type 1 Diabetes (T1D) exemplifies how disease construal evolves through scientific and therapeutic advances, fundamentally reshaping stakeholder relationships and medical epistemology. Pre-insulin, T1D constituted an acute, lethal condition—a death sentence that could only be postponed for a few months through so-called “starvation diets” and patients’ passive acceptance of gruesome decline. Insulin’s discovery in 1921 offered no cure for T1D, but transformed it into a chronic disease, manageable through lifelong self-management and surveillance. While promising survival, this therapeutic revolution introduced unexpected iatrogenic effects including insulin shock and long-term vascular complications. Most recently, the introduction of a three-stage classification framework into ICD coding reframes T1D as a degenerative process, beginning with presymptomatic autoimmunity and progressing toward loss of pancreatic islet function and exogenous insulin dependence.

These successive shifts have profoundly affected both research paradigms and lived experience. For researchers, staging enables earlier intervention points and reframes therapeutic goals from symptom management toward disease modification and prevention. The identification of distinct pathophysiological stages creates new research objects and legitimizes intervention in asymptomatic individuals, raising questions about when disease “truly” begins. For patients, staged classification transforms identity formation and the temporal experience of illness. Individuals transition from sudden victims of acute crisis to navigators of predictable degenerative trajectories, potentially spending years or decades in presymptomatic stages.

This raises critical philosophical tensions: Does knowledge of presymptomatic stages empower through preparedness or burden through prolonged medical surveillance? How do different temporal framings—crisis versus gradual decline—reshape medical authority, patient agency, and individual responsibility? The staged model challenges traditional boundaries between health and disease, creating liminal categories of “presymptomatic patients.” This presentation examines how classification systems constitute not merely organizational tools but ontological claims that restructure clinical reality, research priorities, and the subjective experience of becoming ill, illuminating fundamental questions about predictive knowledge, therapeutic optimism, and whether earlier diagnosis necessarily serves patient interests.

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**Béliveau, Isaac** (Université de Montréal)

*Daniel Garber's Rational but Imperfect Bayesian Agents*

The notion of Old Evidence is quite problematic in Bayesian Epistemologies. When we define scientific confirmation of a theory by a piece of evidence using Bayes' formula, if the evidence was known prior to the formulation of the theory, the formula shows that there is no confirmation. This issue is often attributed to the idealistic nature of the Bayesian agents, with them being logically omniscient (meaning that they believe any tautology or reject any contradiction with certainty). Daniel Garber, in a 1983 article developed a solution to those two problems which consist in restraining the agents' logical capabilities.

Even if some have done it before, I argue that his solution is inadequate in solving the problem of Old Evidence. The focus will be on the nature of reasoning and how his solution generates agents that have strange or contradictory properties.

I aim to show, firstly, that if Bayesian agents are of the Garber type, they can be led to believe with certainty complex tautologies while being ignorant of seemingly trivial ones. Secondly, the distinction between local and global agents that Garber makes doesn't seem to reflect how one is to be uncertain about tautologies or contradictions. I will, at this point, show a better way to conceptualize imperfect Bayesian agents.

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**Brigandt, Ingo** (University of Alberta)

*What Role Should Agency Have in Any Extended Evolutionary Synthesis?*

Recently, biological agency has been upheld as a neglected yet central concept for evolutionary explanations, particularly by researchers advocating for some extended evolutionary synthesis (Nadolski and Moczek 2023, Sultan et al. 2022, Walsh and Rupik 2023). Earlier, Denis Walsh (2015) combined his support for the concept of agency with emphasizing teleology and the purposiveness of biological systems; and purposiveness has likewise featured in some accounts surrounding an extended synthesis (Newman 2023, Uller 2023). In this talk, I analyze gaps in these accounts of agency and teleology, and use this to map out what role agency should have in any extended evolutionary synthesis.

I distinguish three potential roles that the concept of agency could have. Although proponents of agency envision the strongest role (when pointing to fruitful eco-evo-devo research), one problem is that they have failed to show how the notion of agency is needed for or how it would enhance this integrative research. Another problem is that the attempt to portray agency (or purposiveness) as a pervasive and hence crucial phenomenon has led some to adopt an inflationary notion of agency that sees agency (or purposiveness) in any taxon and even at various levels of morphological organization. I argue that instead of adopting a universal notion of agency, the way to make progress at the intersection of evolution, development, and ecology is to distinguish types of agency. By differentiating agency in different taxa and at different hierarchical levels, evolution can be explained in phylogenetic-hierarchical terms. As opposed to making agency the organizing explanatory concept for eco-evo-devo, this requires the involvement of various other concepts and explanatory ingredients. I conclude by pointing to Rui Diogo's (2017) organic nonoptimal constrained evolution (ONCE) theory and Carlos Ochoa's (2025) hierarchical evolutionary-developmental (H-Evo-Devo) theory as more promising frameworks to situate biological agency.

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**Calzavara, Alexandra** (University of Toronto)

*Misdiagnosis, epistemic uncertainty, and misinformation in the case of the New Brunswick Mystery Illness*

Public controversies around “medical misinformation” are typically framed as failures of science communication, media sensationalism, or public misunderstanding. This paper advances a different claim: misinformation can be generated within medical practice itself, when epistemic uncertainty is managed in ways that prematurely stabilize tentative knowledge. Using the New Brunswick Neurological Syndrome of Unknown Cause (NSUC) as a case, this paper argues that diagnostic underdetermination and early causal anchoring transformed provisional clinical judgments into publicly authoritative explanations, producing a self-reinforcing epistemic framework resistant to correction. The paper traces how uncertainty moved across domains and, in doing so, changed its epistemic status. Clinically ambiguous presentations were translated into simplified causal narratives as they circulated through journalism, public discourse, and political institutions. At each stage, pressures for coherence, accountability, and action progressively collapsed uncertainty into apparent certainty. Rather than remaining tentative hypotheses awaiting verification, speculative claims were rendered concrete through repetition, institutional uptake, and alignment with prevailing expectations about medical authority.

This dynamic raises central philosophical stakes. Epistemically, the case illustrates how credibility is unevenly distributed under uncertainty: provisional expert claims accrued authority, while doubt, patient testimony, and demands for verification were sidelined, producing forms of epistemic injustice. Moreover, the analysis shows how professional norms, media logics, and governance structures jointly shape what comes to count as responsible medical knowledge, even in the absence of evidential closure. The NSUC case demonstrates that misinformation should not be understood solely as external distortion or public failure, but as a potential outcome of routine epistemic practices in medicine. By examining how uncertainty is transformed, this paper contributes to HPS debates on epistemic responsibility, the social production of medical authority, and the ethics of public reasoning under conditions of indeterminacy.

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**Casey, Jessica** (The University of British Columbia)

*Inventing Arctic Hysteria*

For decades, psychiatrists have debated whether mental disorders are stable, universal categories or if they are particular to certain places and cultures. Culture-bound illnesses—referring to conditions classified as diagnosable exclusively to specific cultural groups—are an epicenter of controversy in this debate. My study traces the evolution of “arctic hysteria,” a medical condition considered exclusive to Indigenous peoples in Arctic regions. The term was coined by a white settler explorer describing Indigenous locals’ “erratic” behaviors on an 1894 expedition. This concept was taken up by American and Canadian academics throughout the 20th century as they, in alliance with colonizing state authorities, compiled reports, performed unethical fieldwork in Alaska, and published their conclusions. The American Psychological Association classified “arctic hysteria” as a culture-bound syndrome in 1994 and it remained an official diagnostic category until it was discontinued in the 2010s.

This paper will trace the sociopolitical context and scientific processes that produced the classification of “arctic hysteria.” Drawing from the philosophy of science, I will analyze mental illnesses as evolving categories which move in and out of the realm of scientific legitimacy in ways mirroring social and historical patterns. The construction of “arctic hysteria” was the result of a colonial system that exposed

Indigenous peoples to stress-inducing conditions, granted researchers extensive access to Indigenous patients, and shaped research whose empirical validity was obscured by race science and cultural imperialism. Therefore, I will argue that technologies of colonialism co-produced both the formal diagnosis of “arctic hysteria” and the conditions for its construction.

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**Cayer, Fabien** (University of Ottawa)

*John Dewey against the Organizational Theory of Function*

The organizational theory of function holds that the function of an item is defined by its contribution to an autonomous organizational unity. While the organizational theory of function has only recently become popular, proponents explicitly tie it to the systematic biology and philosophy of the early- to mid-19th century. They rarely appreciate, however, the objections that these earlier systematic theories faced that would ultimately motivate a century of less systematic analytic and reductive biological theory. This essay concerns one of these objections: John Dewey’s argument against organizational unity. This essay therefore has two parts. In Part 1, I compare the contemporary organizational theory of function to its historical antecedents, focusing especially on the systematic theories of Immanuel Kant, Georges Cuvier, and the early Dewey himself. In Part 2, I motivate Dewey’s objection to these earlier systematic theories, showing that it holds also against the contemporary organizational theory of function. I conclude by sketching Dewey’s friendly revision to the organizational theory of function that focuses on his concept of the problem.

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**Champion, Heather** (Western University)

*From Data to Distal Phenomena: Model Transfer Inferences for Scientific Discovery with Machine Learning*

Information transfer is an important mode of scientific discovery, where observations made in one domain enable inferences about novel phenomena in other domains. Scientists also aim to use statistical machine learning (ML) in this way, breaking with its classical assumption of a single, static data-generating mechanism. Indeed, the promise of leveraging an existing model for a new predictive task and of gaining insight into a data-scarce domain animates research in dataset shift and transfer learning. Adding to these efforts, I argue that the problem of justifying extending an ML model beyond its initial domain of validity is helpfully analyzed as a problem of model transfer. Here, a specialized representation travels to a novel domain and tends to enable discovery. Particularly, assessing the warrant for model transfer requires treating data heterogeneously rather than homogeneously by default. I analyze types of inferences that undergird cases of model transfer, including generalizing a deep learning model of 3-planet systems to N-body interactions, and pre-training a cancer prognosis classifier on a majority group to improve predictive performance for a data-disadvantaged group.

I argue that extrapolation is a special case of induction, where a conclusion regarding a target domain is (1) sensitive to evidence for an explicit similarity between a source predicate and a target predicate (operationalizing the concept of a domain), and (2) sensitive to evidence that the claim holds for the source domain and/or the source evidence adds weight to the conclusion. Also, successful tests of transfer license no miracles arguments that a model faithfully represents task-relevant information. My analysis lays the groundwork for subsequent normative investigation of how to improve the reliability and impact of these inferences

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**Chen, Hongyu** (University of Toronto)

*Reward Hacking in Machines and Humans*

Reinforcement learning (RL), a mathematical framework that solves learning problems through reward maximization, has been central to engineering high-performing artificial intelligence systems, such as those achieving near- or superhuman performances in domains like playing Go and visual classification. However, RL systems often exhibit a problematic pattern of behaviour known as reward hacking, where a system maximizes the reward function on a literal construal but nonetheless deviates from the engineer's intention. A famous example of reward hacking is a CoastRunner agent that collects rewards by circling in place rather than completing the race as intended. Recent work in the philosophy of cognitive science has argued that humans display analogous behaviours, such as exploiting loopholes in games to obtain rewards without properly engaging in the activity (Buckner, 2023). However, there has been little conceptual work on defining reward hacking in a way that coherently applies to both humans and artificial agents. I argue that the normative structure underlying reward hacking has a dual nature, one that involves both an intermediary success and an ultimate failure. The intermediary success is on a proxy task that has the authority of rewarding the agent to track what actually matters within some perspective or some rule governed practice. The ultimate failure is that the agent fails to track what actually matters. When we say that a system is reward hacking, we are identifying the pattern of behaviour in a system where the system is losing track of what actually matters, but that the system is nonetheless getting rewarded for succeeding on the proxy task that has the authority of tracking what matters. I show that this account resolves a number of conceptual difficulties around defining reward hacking consistently across humans and machines. I end by discussing implications of my analysis to recent neuroscientific work that adopts RL as a framework for understanding human practical agency (Juechems & Summerfield, 2019).

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**Close-Koenig, Tricia** (Université de Strasbourg)

*Prompting History Through Artifacts*

Teaching with scientific artifacts productively engages students more deeply with historical scientific practices and contexts, including social, political and economic questions related to craft, industry, actors and inequalities. I will briefly present a course taught at the Université de Strasbourg to history of science and museology students. The students, working in small groups on an artifact, are initially given no information, forcing them to engage with the materiality of the object and prompting history through artifacts, not history of artifacts. They then have the semester to conduct research and analyse the history, production and/or conservation of the item.

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**Collings, Frederick** (King's College London)

*The Ideology of Pragmatic Humeanism Sustained*

Pragmatic Humeanism's development has been influential in Humean accounts of the lawhood recently, being argued to topple canonical best system accounts (BSAs). The laws of nature are still a special grouping of truths in reality when organised into a logical system (Mill 1851; Ramsey 1929; Lewis 1973, 1983, 1994). But Pragmatic Humeanism understands this special grouping as those truths entering the best system according to various pragmatic virtues (Dorst, 2019; Hicks, 2018, Jaag & Loew, 2020). This descendant BSA view adheres to Humean reductionism; all truths about reality reduce to the distribution

of properties across the spacetime manifold, lacking necessary connections—such that there is no fundamental modality.

However, pragmatic concepts seem to appeal to modal notions. Pragmatic virtues appear to support subjunctive conditionals (Hildebrand, 2024), because they appeal to goals, abilities and limitations, and interests, they seem to involve how things could be/have been or how things must be (ibid.). This undermines the reductionist commitment of Pragmatic Humeanism, that everything reduces to the nonmodal Humean mosaic, including the laws. If pragmatic notions support subjunctive conditionals, and the truth values for subjunctives are (typically) given by referring to laws, the account is circular and modally robust; latent modality which has not been reduced.

This talk clarifies the ideology of Pragmatic Humeanism, arguing that pragmatic concepts need not support subjunctive conditionals. Primarily, it's unclear where circularity comes in and it is argued that the metaphysical account of laws is explanatorily downstream of patterns constituting pragmatic notions. Moreover, the ontology of laws in system views is complex (Demarest & Wilhelm, forthcoming.), contrary to that implicit in the challenge. And taking a particular view of the Humean mosaic quells other objections. These responses and objections are discussed, at which point key issues in the debate are delineated.

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**Delmore, Tyler** (York University)

*Mind Without Mentalism: Behaviorism's Substantive Account of the Mind*

Behaviorism – the movement in 20th century American psychology – is often framed as the result of a methodological crisis. Introspectionists' techniques introduced private, subjective observations that undermined psychology's scientific credibility. Psychology's solution, mobilized by Watson (1913; 1914), was the rejection of not only introspection but the mind, with the field turning to animal work, “mechanical conjunction”, and physiology (Boden 2006).

There are many aspects of this story worth challenging. What I challenge distinctly is the belief that behaviorists, in any large part, *rejected the mind*. I show that, upon a close reading of behaviorists' work and its philosophical precedents, behaviorism had adopted a readymade account of the mind from earlier thinkers, a view that aligned with their methods.

Especially potent is the work of the “New Realists,” (e.g. RB Perry 1908; EB Holt et al. 1912). These philosophers arrived at a proto-behaviorism, however, not because of concerns about methods or scientific credibility, but because of broader commitments, including a distinct ‘substantive’ sort of mind. Namely, they believed the mind was an objective phenomenon, “out there” in the world, and characterized by the set of capacities through which animals adapt their responses to the environment.

This view dovetailed with behaviorism's methodological practices, including a focus on the environmental “functions” controlling animal responses (Holt 1915) But the view was not \_derived from\_ a concern about methods or experimental techniques, it had independent sources and influences. This intellectual context tends to be obscured by the primacy given to Watson's “crisis”. Moreover, upon reconstructing this origin, it's possible to more accurately begin to dispel the notion that behaviorism was a matter of rejecting the mind, of mechanism, physiology, and so on. The functionalist, relationalist sort of mind discussed by Holt, Perry, and others can be shown to underlie much of the behaviorist movement.

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**Doering, Sydney** (University of Calgary)

*Experiments as Models: Agents and Context in Biology*

Scientific models are central to understanding, investigating, and predicting phenomena. While traditional accounts often focus on abstract models derived from theory or constructed with experimental data, experiments themselves can function as models. I look at experimental models where the models are composed of living systems that are used to explore biological possibilities. I develop a view of experimental models that draws on Bas van Fraassen's account of representational activity and Marcel Weber's view of experimental modeling. Combining key features of each account emphasizes the role of agents and context in experimental modeling, and it outlines how experimental models contribute to theory. I illustrate this view through an analysis of an experiment performed by William Ratcliff and Michael Travisano that investigates the transition from unicellularity to multicellularity. I argue that treating this experiment as an experimental model demonstrates how experimental practices can be used to investigate biological possibilities and evolutionary dynamics.

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**Doolittle, Ford** (Dalhousie University)

*The History of ITSNTS Thinking*

Holobiotic traits cannot easily be reconciled with Lewontin's way of thinking about evolution by natural selection. There are, as Godfrey-Smith says, "too many parents". But they do match Richard Dawkins' or David Hull's replicator/vehicle (interactor) formulation, which is very close to It's the Song, Not the Singer(s) Theory. I'll review the development of this theory, from its beginnings as a reaction against fuzzy holobiont thinking (expressed by many other molecular biologists) to its full recent development and elaboration. I'll explore the relationship between ITSNTS thinking and replicator/interactor theory (relating to the mechanism of natural selection), John Dupré's more generally metaphysical "process ontology", and the most recent instantiation of ITSNTS, where it was successfully link it to Papale's theory about lineage-independent natural selection.

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**Douglas, Gavin** (University of New Brunswick)

*The Holobiont Is Still Not a Useful Model for Most Host-Microbiome Interactions*

The holobiont concept refers to a host and associated microbes. It has been critiqued over the last decade, primarily based on the argument that individual holobionts are not an appropriate level for analyzing multi-generation host dynamics, as most microbes are acquired from the environment. Several counter-arguments were raised in response to this and other criticisms. Despite these responses, we argue that the holobiont concept and related terms generally do not provide useful models and can be easily misunderstood. How humans subdivide nature into categories is somewhat arbitrary, but we should strive for categories that are both informative and unambiguous. The holobiont concept is neither. For instance, microbial shifts in relative abundances have been described as holobiont adaptation, but this provides no additional biological information and is an unnecessary introduction of Lamarckian evolution. We reiterate the previously made point that existing biological categories are sufficient to describe host-microbiome dynamics and enable complex dynamics to be described while avoiding oversimplification.

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**Due, Austin** (East Tennessee State University)

*What are Drugs?*

It is surprising that until recently little philosophical attention has been paid to what makes something a drug. My aim is to offer such an account covering medicinal and recreational contexts. I first consider whether drugs are natural or functional kinds and conclude that they are not so. There are no intrinsic or functional properties that can be articulated that cover ‘drug’ which do not also cover some instances of ‘food.’ I call this the ‘food creep’ problem. With this problem in mind, I consider whether a social-epistemic account of drugs fairs better. Drugs on this account are such insofar as they have different expectations around them than food has. However, this also is subject to food creep since ‘food’ as a category is socially-negotiated, and it is possible that something with drug-expectations would be considered food after some negotiation. This is a consequence of the social-epistemic account of drugs being merely descriptive. So, I finally contend that an account of ‘drug’ must also be normative. I appeal to ‘institutional kinds’ as articulated by Kukla (2014/2022) to make sense of such an account. That some ‘x’ is a drug is descriptive insofar as it has some distinct expectations or attitudes surrounding it, and it is normative insofar as there are things we ought not have such expectations about. In short, I give a non-relativist and pluralist account of ‘drug’ which offers insights on the history of the ‘drug’ ascription, regulatory policies, and whether ‘drug’ as a term should be eliminated.

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**Dussault, Antoine C.** (College Lionel-Groulx)

*ITSNTS Evolution: Must Choral Groups Be Interactors?*

In this presentation, I will consider how “It’s the song, not the singer” (ITSNTS) theory might offer something broader than interactor-replicator evolution by natural selection. Focusing on ITSNTS theory as applied to ecosystems of “macrobes,” I will first identify a blind spot in its early formulations. The blind spot stems from intuitive thinking about ecological niches, which conflates two ways in which organisms of different species can be ecologically equivalent — that is, equivalent in using similar resources (i.e., belonging to the same guild), or in fulfilling similar functional roles in ecosystems (i.e., belonging to the same functional group). Next, I will show how a possible fix, given this blind spot, is to restrict ITSNTS evolution by natural selection to “trait-group” interactors, but will also propose an alternative. The alternative identifies conditions under which an interaction network (i.e., a song) can recruit appropriate “singers” through providing them suitable ecological niches.

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**el Nabolsy, Zeyad** (York University)

*History and Philosophy of Science Meets the Nahda: Rifa‘a al-Tahtawi, Copernican Astronomy, and the Question of Instrumentalism*

Rifa‘a al-Tahtawi (1801 – 1873) is widely seen as the father of the Nahda [or Renaissance] in the Arab world. The Nahda was an intellectual movement aimed at reform in the Arab world during the nineteenth century with the goal of catching up to the West. Despite Tahtawi’s importance for understanding the philosophical reception of modern science in the Arab world, not much attention has been paid to his views on science. The work of the historian John W. Livingston forms an exception. In this paper, I argue that while Livingston is to be commended for taking Tahtawi’s views on science seriously, his reading of Tahtawi as an instrumentalist about scientific theories is incorrect. Using the case study of Tahtawi’s

reception of Copernican astronomy, I show that Tahtawi was not an instrumentalist. I contend that understanding Tahtawi's philosophy of science is important for grasping the subsequent reception of modern science in the Arab world.

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**Elwick, James** (York University)

*Black Markets in Knowledge: what Cheating on 1870s Ontario Exams and the Origins of 'Academic Integrity' can tell us about Epistemology and Expertise*

Ontario in the 1870s saw a rash of examination cheating. These cases usually involved examiner misconduct and teachers cheating on their own certification exams. Presiding examiners wrote out blackboard answers to physics tests being written in that very room. Thefts of proofs from printers' offices created a black market of pre-circulating exams. Mathematicians running exams set questions directly out of their own textbooks to drive up sales. Gangs of young men wrote in cyphers to coordinate the buying and selling of stolen exams.

Yet to be spotted, cheating had to occur against a uniform background. This paper therefore situates these cheating cases against a backdrop of newly standardized Canada West and Ontario exams. These tests were part of a rapidly spreading system: newly important credentials such as high school degrees and teaching certificates. These certificates became widely recognized, and institutionally trusted, symbols of knowledge and expertise.

These 150-year-old cases are relevant for our own time as we panic over AI. Yet they should also interest historians and philosophers of science. Not only can these cheating cases be appreciated through familiar discussions about procedural objectivity. We can better understand cheating, and its backdrop, through such newer concepts as the "substitution of precision for validity" (Star), "formalizing practices" (Lampland), and "engines of anxiety" (Espeland and Sauder).

To combat cheating - and to emphasize the moral economy of exams as unbiased engines of meritocracy - a routine emerged. It is doubtless familiar to anyone reading this abstract: the solitary and unaided test-taker frantically scribbling out their mind's contents onto paper. I end by wondering how this universal experience, foundational to what we now call 'academic integrity,' may also have contributed to our intuitions that knowledge is solely individual.

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**Erasmus, Adrian** (University of Alabama)

*Artificial Intelligence and Medical Evidentiary Standards: Implications for Evidence-Based Medicine*

Artificial intelligence is increasingly transforming medicine, especially oncology, in ways that challenge the evidentiary standards of evidence-based medicine. This paper argues that medical AI often relies on forms of evidence traditionally relegated to lower tiers of evidence hierarchies, such as mechanistic, observational, and clinical evidence, and generates a distinctive synthetic form of evidence through prediction, trial support, and evidence amalgamation. Because existing evidentiary standards do not account for either AI evidential use or generation, they are no longer adequate. At minimum, current evidentiary standards require substantial revision. At most, the rise of medical AI may signal the end of evidence-based medicine as we know it.

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**Fadey, Tolulope** (University of Manchester)

*Epistemic Trust and the 'Silent Pandemic': A History of Maternal Vaccination and Antimicrobial Resistance in Nigeria*

The history of maternal health in Nigeria is often framed as a struggle for clinical access. While historiography by scholars like Elisha Renne maps the intersections of missionary medicine and reproductive politics, a critical gap remains: the historical evolution of the pharmaceutical fix in the labour ward. Existing narratives have insufficiently historicised how the rapid introduction of life-saving vaccines and antibiotics created an epistemic dependency that now fuels the modern crisis of Antimicrobial Resistance (AMR). This paper addresses this silent pandemic by investigating the shifting landscape of medical trust among mothers in Lagos, Nigeria from the mid twentieth century to the present. I argue that the historical over-reliance on antibiotics in maternal care often as a substitute for broken sanitary infrastructure laid the groundwork for today's AMR challenges. Using a bio-historical methodology, I synthesise colonial medical archives with contemporary public health data on neonatal sepsis. By centering the maternal experience, I demonstrate that vaccine hesitancy and antibiotic misuse are not products of ignorance but are rooted in a historical search for agency within a paternalistic system. This research reveals how the ghosts of colonial medicine continue to haunt the digital-age pharmacy, moving the conversation beyond mere access toward a philosophy of trust.

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**Fenton, Andrew** (Dalhousie University)

*The Whale Sanctuary Project: Scholar Advocacy and Interspecies Justice*

See last two pages/voir les deux dernières pages.

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**Ferestade, Iman** (Australian National University)

*A Two-Dimensional Account of Features*

Mechanistic interpretability seeks to reverse-engineer neural networks by identifying internal variables, often termed features, that are taken to constitute the model's basic computational and representational units. Despite notable progress in feature discovery, the field lacks a principled account of what, exactly, qualifies as a feature. This paper addresses that gap by distinguishing between the concept of a feature and competing conceptions of it. I first articulate the target concept by specifying the functional role that "features" must play within interpretability as a scientific practice. I argue that this role is dual: features must (i) underwrite bottom-up understanding of model behavior and (ii) exhibit an appropriate form of universality.

On this basis, I assess prominent conceptions of features—mathematical, atomic, human-understandable, and input-property-based accounts—and argue that each fails to satisfy the combined epistemic and universality demands. I then advance a positive proposal grounded in two-dimensional universality. On this view, a representational pattern counts as a feature only insofar as it is reliably elicited (1) across multiple instances within a relevant input class, and (2) across distinct models trained on or exposed to that class. Importantly, I argue that universality is best treated as graded rather than binary. While the Platonic Representation Hypothesis counts only maximally convergent patterns, I argue this is too demanding for interpretability's aims. In practice, we need patterns that are stable enough across relevant

model variations to support intervention and explanation, even if they are not universal. Featurehood should therefore scale with demonstrable cross-model stability. This also shifts the focus from mapping features to human concepts to characterizing their computational role within a model.

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**Frankel, Melissa** (Carleton University)

*Madness in and beyond the Cartesians*

In his first Meditation, Descartes seems to briefly entertain the possibility that he might be mad, like those people who “maintain ... that they are pumpkins, or made of glass” (CSM 2: 12). Later in the 17th century, Malebranche, too, considers a variety of cases of madness, including those people “who imagined they were made of butter or glass or that their body was not shaped like other men’s, that it was like that of a cock, a wolf, or an ox” (Elucidation 6, LO 570). In this paper, I trace these striking examples of madness back to a set of case studies from early 17th century medical treatises. I show how these specific case studies linger both in the philosophical imaginary of the 17th century, as well as in some of the 18th century attempts to systematize scientific and philosophical knowledge, as, e.g., in Diderot and D’Alembert’s *Encyclopédie*. I consider both the specific analyses that these cases are given in the medical literature, as well as their proposed therapeutic treatments. The picture that emerges is one in which mad or delusive experiences are bound up with the imagination, and more generally, with a particular physiological account of the sensory-cognitive system, on which madness is to be understood as just one of a number of ‘aberrant’ cognitive states, all of which can be explained (and treated) through a consideration of the system as a whole. This then allows me to reconsider one common reading of the Cartesian account of madness, on which madness stands in opposition to reason. Against this reading, I argue that for the Cartesians, madness is not a defect of reasoning, but rather, is – like all other sensory states – explicable by way of the general mechanisms of sensation, grounded in the mind-body union.

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**Fraser, Reid** (Independent Scholar)

*“You Call; We Haul” The History of Paramedicine*

The professionalization of emergency medical services (EMS) represents one of the most significant transformations in modern healthcare. Prior to the late 1960s, ambulance services across North America were fragmented, unregulated, and frequently operated by funeral homes with little or no medical training or standardized equipment. Rising rates of traumatic injury and cardiac-related mortality exposed the inadequacies of these systems and underscored the urgent need for structured pre-hospital care. The 1969 Airlie Conference, convened by the American College of Surgeons, marked a pivotal moment in redefining the role, training, and regulation of emergency medical personnel. The conference brought together physicians, policymakers, and EMS stakeholders, and identified systemic failures in training, equipment, dispatch coordination, and financial support, and advanced comprehensive recommendations for reform.

Central to these reforms was the establishment of standardized educational requirements, including the conference’s call for a two-year college-level training program and clinical exposure to essential emergency procedures. The Airlie Conference also advocated for national certification and regulatory standards, laying the groundwork for the modern paramedic registry and structured oversight bodies seen today. Another enduring contribution was the endorsement of unified dispatch systems, exemplified by

the Jacksonville 911 experiment, which demonstrated the life-saving potential of centralized emergency communication.

While the conference catalyzed the transformation from ambulance attendant to trained paramedic, its major themes around funding, wages, regulatory consistency, and scope of practice still remain subjects of debate in contemporary EMS. The legacy of the Airlie Conference lies in the establishment of the professional identity for pre-hospital providers and its influence on the development of today's highly trained, clinically capable paramedics. Understanding this historical turning point provides essential context for ongoing challenges in EMS sustainability, workforce retention, and the continual evolution of pre-hospital medicine.

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**Gass, Gillian** (Dalhousie University)

*Bringing Scientific Objects Over the Threshold of the History Classroom*

There is no reason for thinking that teaching with artifacts would be more daunting than teaching with historical documents or textbooks. It is not only extremely rewarding and a unique way to go beyond the "usual stories" and to recover the practices of science, but it can be a way of making history of science more accessible to many. Yet, we often hesitate. In this part of the session, we answer your questions on how to overcome such worries, and offer practical tips on how to prepare both ourselves and our students for a hands-on study of artifacts, and help scientific objects cross the thresholds of our classrooms.

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**Gavrus, Delia** (University of Winnipeg)

*"The One Most Fragile Organ of the Body": A Patient's Neurosurgical Experience at the Montreal Neurosurgical Institute*

Only a few years after the Montreal Neurological Institute opened in 1934, a young patient from Eastern Canada arrived in the bustling city to consult the neurosurgeon Wilder Penfield about the severe epilepsy that was the result of a childhood sinus procedure. Based on the patient's art, diary entries, newspaper accounts, educational records, medical accounts, family papers, as well as oral history interviews with the patient's children, this paper recovers the experiences of a patient undergoing neurosurgery in the early twentieth century and charts the life that this surgical event profoundly shaped. An accomplished trained artist, the patient illustrated his feelings about brain surgery in a harrowing drawing and in diary entries. This history-from-below aims to illustrate the ways in which patients made sense of their experiences in this early period in the history of neurosurgery.

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**Gillier-Ducarroz, Véronique** (École normale supérieure (ENS) de Lyon)

*La place des laboratoires dans la structuration de l'astrophysique en tant que discipline en France*

Christian Jacob définit le laboratoire comme "un lieu habité par un collectif d'acteurs dans la diversité de leurs statuts et de leurs fonctions, où l'on se livre à des opérations codifiées et normalisées, répétitives et cumulatives, et où des connaissances sont construites et validées" (C. Jacob, 2014). S'il est difficile de parler de telle structure pour l'astronomie – science d'observatoire – l'astrophysique naissante, en cours

d'institutionnalisation dans le champ français, voit se multiplier des laboratoires à son nom à partir des années 1930, mais surtout 1950. En 1936 est créé l'Institut d'astrophysique de Paris, sous la tutelle de la Caisse nationale de la recherche scientifique, qui devient en 1939 l'un des premiers "laboratoires propres" du jeune CNRS, hors du giron de l'Université et de l'Observatoire. La diversité des intitulés, des statuts et des tutelles des structures créées ensuite reflète l'état d'une discipline en cours de construction, au moment où la notion même de laboratoire se transforme. Mais quel lien tracer entre le Service d'astrophysique de Toulouse (né en 1935), le "labo Schatzman" des années 1950-1960 et les multiples structures de recherche "astrophysique" du CNRS des années 1980-1990 ? Cette étude s'appuiera sur les dossiers de laboratoires tirés des Archives nationales françaises (du CNRS, de l'Université, de l'Observatoire) et de témoignages des acteurs (écrits, entretiens). Ce qui se dessine est la naissance d'un nouveau métier : celui de chercheur dans l'étude des astres, hors du corps des astronomes. C'est à la rivalité entre astronomes et astrophysiciens, observatoires et laboratoires, que semble répondre la création de l'Institut national des sciences de l'univers (INSU) en 1985, sous la tutelle duquel sont placées toutes structures relevant de l'astronomie-astrophysique (y compris les observatoires).

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**Grenier, Olivier** (Université du Québec à Montréal)

*Bridging the Gap Between Evidential Pluralism and Realist Evaluations in Evidence-Based Education*

Evidence-based education is a well-known approach to pedagogical decision-making that is often criticized because, among other things, of its assumed overreliance on results from randomized trials and meta-analyses since its proponents consider them the most adequate methods to establish causal claims about educational interventions effectiveness. To answer these criticisms, pluralist evidence-based frameworks have been developed, among which evidential pluralism (EBP+) and the UNESCO's EBE3 framework are the most noteworthy. While they address the same problem, these two frameworks envision scientific pluralism quite differently. On the one hand, EBP+ claims that mechanistic studies must be used alongside statistical studies to establish causal claims. On the other hand, EBE3 claims that while causal claims should be established with randomized trials and meta-analyses, their results should be combined with realist evaluations that leverage qualitative and collaborative research to evaluate contextualized mechanistic explanations of causally effective pedagogical interventions. However, proponents of EBP+ claim that realist evaluations are flawed because they are founded on causal realism, a thesis according to which causal mechanisms referred to in scientific theories and models exist out there in the world, while evidential pluralism is founded on epistemic causality, a thesis according to which established causal claims are simply a useful tool for reasoning, prediction and decision-making. I will argue, based on interviews I did with educational researchers, that EBP+ has an important flaw of its own – that EBE3 does not share –: it assumes that the only relevant contribution of educational research to decision-making is establishing causal claims about interventions effectiveness. Perhaps more importantly, I will also show that the EBE3 framework can be made compatible with epistemic causality by relying on the more general family of theory-based evaluations instead of the specific category of realist evaluations, thus avoiding issues related to causal realism.

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**Guillin, Vincent** (Université du Québec à Montréal; CIRST)

*Causalité et efficacité: le cas des biothérapies dans le traitement des MICI*

Selon la thèse Russo-Williamson, pour établir un lien de causalité en médecine, il faut démontrer deux choses : premièrement, que la cause présumée et l'effet présumé sont correctement corrélés ;

deuxièmement, qu'il existe un mécanisme qui explique les cas d'effet présumé en termes de cause présumée et qui peut rendre compte de cette corrélation (Russo & Williamson 2007; Williamson 2019). Dans une perspective épistémique, il semble en effet raisonnable de ne pas se contenter uniquement d'éléments de preuve statistiques pour déclarer efficace un traitement, mais qu'il semble falloir aussi pouvoir s'appuyer sur une explication de cette efficacité : nous ne voulons pas simplement savoir qu'un traitement fonctionne, mais nous voulons aussi savoir pourquoi il fonctionne, parce cette composante explicative est censée permettre de justifier et de comprendre l'effet thérapeutique. Et pour Russo et Williamson, c'est l'identification d'un mécanisme doit permettre de le faire. Pour éclairer cette thèse, nous nous intéressons à la manière dont, dans l'évaluation des biothérapies pour les maladies inflammatoires de l'intestin et du colon (MICI), les attributions causales relatives aux effets thérapeutiques sont formulées par les praticiens et dans quelle mesure elles sont étayées par des explications de type mécanistiques. Pour ce faire, nous exploitons un corpus d'une vingtaine d'articles scientifiques, publiés entre 2014 et 2024, évaluant l'efficacité des biothérapies dans le traitement des MICI. Notre analyse montrera que celle-ci est bien effectivement pensée en termes causaux, mais que l'élément mécanistique n'y joue pas nécessairement le rôle que lui attribuent Russo et Williamson.

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**Hamel-Mottiez, Jacob** (Université Laval)

*From Continuity to Estrangement? Philosophy of Biology in Perspective*

Following Thomas Kuhn's characterization of science as "the constellation of facts, theories, and methods collected in current texts" (1962), interest in the cartography of science has grown substantially in recent decades. Advances in data availability and in methodological tools for describing scientific practice have made such analyses increasingly feasible. Philosophy of science has not remained untouched by this broader "science on science" movement.

Beyond general philosophy of science, specific subfields, such as philosophy of biology, have also employed computational methods to investigate their field (Byron, 2007). These approaches have not only served descriptive purposes but have also been mobilized to raise normative concerns, particularly regarding a purported and potentially unjustified estrangement between the interests of philosophers of biology and those of practicing biologists (Gayon, 2009; Pradeu, 2017; Laplane, 2025). Such concerns are especially salient given that philosophy of biology has traditionally conceived of itself as continuous with biology, differing from it primarily in degree rather than in kind (Callebaut, 1993). However, much of the existing work has focused narrowly on the scientific output of Biology & Philosophy alone, and its conclusions have recently been called into question (Malaterre et al., 2020). As a result, claims about estrangement in philosophy of biology remain unsettled.

This paper seeks to address this gap. By examining philosophy of biology in its main specialized journals, we aim to test the following estrangement hypothesis: over time, philosophy of biology becomes increasingly shaped by its own internal dynamics, leading to a growing mismatch between developments in contemporary biology and their representation within philosophical discourse.

Based on our findings, we further examine whether this representation should be regarded as problematic and whether certain areas of biological research warrant greater philosophical attention than others—and, if so, for what reasons.

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**Hamilton, Vivien** (Harvey Mudd College)

*The Peril of Oxygen: The Incubator and Infant Blindness*

Just as incubators became a stable feature of hospital care in the 1940s, clinicians noticed an increase in the incidence of blindness in premature infants. By the early 1950s, there was widespread medical consensus that supplemental oxygen provided to babies in the incubators was causing irreversible damage to blood vessels in the eye. This paper examines the development of medical knowledge and ethics during a few short years of crisis as doctors became aware of, investigated, and reacted to this emergency. I ask how a particular kind of technological optimism about the incubator and other respiratory technologies shaped initial clinical investigations into the cause of blindness, and I trace evolving debates about ethical experimentation on babies. This is a story of medical harm, but it is also a story of parental agency and I highlight the work that parents did to advocate for funding for research and also to sue for medical malpractice.

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**Hamm, Ernie** (York University)

*Geology, Geological Laws and Leopold von Buch*

Leopold von Buch (1774-1853) stands among the towering figures in “the heroic age of geology”, those early decades of the nineteenth century during which, in the words of William Whewell, geology had “slain its monsters”, those fabulous theories from the not-so-distant past and laid the foundations for its future. Von Buch traveled widely, wrote elegantly, presented bold hypotheses, and was well-connected (intellectually and socially) with European scientific elites. By the 1870s he was described as standing alongside Alexander von Humboldt as one of the “princes of science” and a “star of the first order” among geologists. Yet that praise came with a caveat: there was “glory enough” for von Buch, to be sure, even if some of his doctrines “no longer seemed tenable.” In twentieth-century historiographies that traded in the “isms” of catastrophism and a triumphal uniformitarianism, or that pitted seemingly disinterested geologists that could see the bigger picture against practically minded mineralogists or “geognosts” focused on careful description of the earth’s crust, von Buch could hardly fare well. Among those who have attended to von Buch, his early work presented to the Berlin Academy (1806) is usually seen as an outlier, an example of youthful Romantic wholism or even Hegelian idealism that quickly gave way to a more sober-minded geology. Such interpretations are wide of the mark, for they miss something crucial. Von Buch was a man of his time, that is, of the Enlightenment. This paper argues that von Buch was not a part of the culture of nineteenth-century university science and its creation of disciplines and specializations, but was guided throughout his career and even in his boldest ideas by a consistent search for laws and principles of geology.

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**Hiscock, Faye** (Independent Scholar)

*The Proportional Prowess of Artists in Luca Pacioli’s Summa arithmetica (1494)*

This paper will discuss the definition of the term “proportion” for Renaissance mathematician, Luca Pacioli (1445-1517), and his Italian contemporaries. It will explore how this definition relates to a selection of paintings by artists whom Pacioli praises for their use of proportion in his *Summa de Arithmetica, Geometria, Proportioni et Proportionalità* of 1494. These include Pietro Perugino’s *Delivery of the Keys*, Sandro Botticelli’s *Temptations of Christ*, Domenico Ghirlandaio’s *Vocation of the Apostles*,

Filippino Lippi's Triumph of St. Thomas Aquinas Over the Heretics, and Melozzo da Forlì's Sixtus IV Appoints Bartolomeo Platina Prefect of the Vatican Library. All five are large frescoes in Rome that were accessible and completed before 1494, the year of the Summa's first publication. According to Pacioli, proportion was a type of disposition, namely, the relationship between two or more quantities or things.

This paper will argue for the first time that these five paintings exemplify Pacioli's definition of proportion through their use of geometry. This study reinforces and emphasizes the strong dialogue between art and mathematical literature that existed in the late Quattrocento, while helping us to understand why Pacioli praised the artists that he did. It also elucidates late Quattrocento painting through the period definition of proportion, which was both mathematical and a metaphor for humanity's relationship to God.

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**Jafar, Rida** (University of Guelph)

*Everyday Cyborgs and the Reversibility Assumption*

Rapid developments in cybernetic medical technologies—most notably brain–computer interfaces (BCIs)—have reignited scholarly interest in the cyborg as an empirical entity and an everyday, lived condition (Haddow, 2021). While researchers have increasingly recognized the importance of examining patient perspectives of living with cybernetic devices, the experience of device removal remains under-explored. This neglect, I will argue, stems from a tacit reversibility assumption across cyborg literature which presumes that removing a cybernetic device simply restores an individual to their pre-cyborg state—a view that I will argue is dangerously false.

First, I outline how this assumption can be traced to early cyborg literature's reliance on a mechanistic model of the body, where bodily components are functionally interchangeable without cognitive impacts, as well as deterministic accounts of cyborgization that render device removal as philosophically insignificant (Clark 2003; Haraway 1991). Next, I draw on emerging patient reports following BCI explantation to reveal that device removal can produce lasting phenomenological and epistemic harms, leaving individuals in a comparatively worse state than before implantation (Gilbert et al., 2023). These new findings undermine the reversibility assumption and suggest that cyborgization is a process of becoming across multiple axes, where some changes cannot be reversed. This has important implications for informed consent practices and post-trial responsibilities in medical device research, and highlights the need to pay greater attention to patient experiences of cybernetic device removal.

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**Jalal, Anika** (University of King's College)

*Anticolonial Science: Reorientations of Western Modern Science in Mahendralal Sircar's Visions of the Indian Association for the Cultivation of Science (1863-1905)*

Present historiography on modern science in the nineteenth-century overwhelmingly revolves around the colonizer, and seldom the colonized. While empires like that of Britain most certainly fostered modern science to expand colonial boundaries and exploit Indigenous land, this paper examines the converse in the context of colonial India: how modern science as a Western import served purely anticolonial ends. More precisely, I argue that the Bengali, British-educated intellectual proletariat—the bhadralok—reoriented their scientific education to bolster their anticolonial and nationalist agendas. I analyze the contributions of one particular bhadralok, Dr. Mahendralal Sircar (1833-1904), a physician

who established the Indian Association for the Cultivation of Science (IACS), the first distinctively Indigenous institute of science in India. Drawing on Sircar's diary entries, lecture transcripts, popular broadsheets, and volumes of a bhadralok-authored magazine called "The Dawn", I trace three phases of Sircar's visions of the IACS: the contemplative phase (1863-1875), pedagogical reformation phase (1876-1896), and moral dilemma phase (1897-1905). Throughout this chronology, I make the distinction between the life sciences and physical sciences. In the life science stream, I claim that Sircar's proclamation that homeopathy is superior to allopathy was an intentional schism from British-supported medicine. Additionally, Sircar's turn to the physical sciences—namely, astrology and chemistry—did not merely exist in a secular vacuum. Instead, according to Sircar, the physical sciences reveal nature's facts, providing evidence of a Hindu creator. Ultimately, the propagation of an anticolonial modern science by the bhadralok intelligentsia fueled the rallying cries for Indian self-sufficiency (Swadeshi) at the dawn of the twentieth-century.

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**Jensen, Nayani** (University of Toronto)

*Writing Storms: Greenwich Observatory and the development of a rhetoric for weather (1820-1845)*

In November of 1840, Greenwich Observatory formally commenced its "Meteorological and Magnetical department," and James Glaisher and assistants began making observations every two hours, night and day. But dedicated meteorological observation had been occurring at Greenwich for decades, often in an astonishing multiplicity of records—officially for astronomical work, unofficially in daily notebooks or for private interest by various employees for submission to periodicals. By close-reading the overlapping meteorological notebooks and records of the Greenwich Observatory for 1820-1845, this paper demonstrates that there was by no means a consensus surrounding the correct approach to a meteorological record and report, particularly when it came to recording unusual or extreme weather. Debates about the degree to which personal observation should be relevant, debates about the role of a central official record, and debates about language down to the inclusion of adjectives shaped transformations in the discipline. The designation of an official meteorological department only highlighted the tensions of fashioning the study of weather and climate into a quantitative, centralized science.

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**Jones, Andrew** (University of Toronto)

*The Macaque with Kaleidoscope Eyes: Ronald K. Siegel, Primatology, and the Politics of Hallucinogenic Drug Use in 1970s California*

After nine days of sitting in complete darkness, Lucy took a puff of a cigarette laced with the powerful hallucinogenic drug dimethyltryptamine (DMT). Prior trials in her home cage revealed that Lucy, an adult rhesus monkey, would only take small puffs of such cigarettes in exchange for food and water. This time, experimenters wanted to know whether she would self-administer DMT in conditions of sensory deprivation, even with food and water readily available. She did. By day nineteen, she was smoking multiple DMT cigarettes a day and appeared to enjoy following and grasping for objects that were not there.

This experiment was orchestrated in the 1970s by the American psychopharmacologist Ronald K. Siegel at UCLA. Siegel became interested in hallucinogenic drugs as a doctoral student at Dalhousie University. His own experiences with them were unpleasant; he felt nauseous, dizzy, and disorientated. Yet both

human and nonhuman animals willingly ingested them. Indeed, during extensive fieldwork Siegel observed many nonhuman animals eating hallucinogenic plants even though these plants compromised survival instincts. To explain these observations, Siegel postulated a “fourth drive” in addition to hunger, sex, and thirst: an intoxication instinct. But what drove this instinct, given the negative consequences? His human subjects pointed to the astonishing visual hallucinations of intricate geometric patterns. Did nonhuman animals have similar experiences? To find out, he designed a series of behavioral metrics and experiments to get inside the minds of intoxicated animals.

This presentation uses recent historical scholarship that examines the moral economy of animal experimentation to assess Siegel’s work. In *The Bureaucracy of Empathy* (2023), Shmueli argues that regulation surrounding vivisection in late 19th century England forced experimenters to empathize with their nonhuman subjects to assess suffering. Similarly, Siegel’s work represents an innovative attempt to see into animal minds using the methods of behavioral pharmacology.

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**Johnston, Eleanor** (York University)

*Exploration and Constraint: Objects versus Workbooks in 21st Century Ontario Classrooms.*

Education uses objects both in the practical sense of how things happen, and in the moral vein of why they should/n’t happen. The object itself can discipline the practical outcome through threat: the engine won’t start. When seeking moral outcomes, there is an anxiety of perverse knowledge; What if the student decides Nazis are cool?

As Ontario moved from models and textbooks to centrally chosen objects (dump boxes) to locally selected objects under curricular aims, objects’ innate connection to knowledge was hidden; teach graphing but not its origins from the seven bridges problem. The curriculum now dictates outcomes; The caboose is in front of the engine. In a curricular objects approach, curricular outcomes are used to select and question objects, partially restoring autonomy. This paper explores the tension between exploration inherent to object education and the constraint of curriculum through a variety of objects and contexts including steam engines, multi-media boxes, and the Passover Haggadah.

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**Jones, Elis** (Technische Universität München)

*Adding another prefix: do we need a socio-biogeochemistry? Or, where are the humans in ITSNTS?*

The "It's The Song, Not The Singer" theory of evolution suggests that biogeochemical cycles themselves can be units of selection, i.e. are a potential beneficiary of evolutionary processes. Put more simply, the claim is that cycles of elements, including the living things which transform, distribute, and perpetuate them, are - from an evolutionary point of view - worthy of consideration as individual entities in their own right. In this talk I explore two questions related to the role of humanity in this picture. Firstly, what kinds of substances can form these cycles? Can human-derived or non-elemental substances be included? Secondly, what role does human judgement play in individuating these cycles? The answers to both of these questions involve considerations of a range of interests (human and non-human) and also suggest the need for a socially-engaged study of biogeochemistry.

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**Kaiser, Kevin** (Université de Montréal)

*Cultural Evolution Studies: The concepts of culture and their integrative potential*

The study of cultural evolution is an interdisciplinary research field attempting to understand cultural phenomena in the light of evolutionary thinking. Due to the nature of its subject, located at the intersection of psychology, sociology, anthropology, and biology, the field faces significant conceptual challenges owing to the diversity of contributions that need to be integrated.

One of the main discussion points concerns the concept of "culture." Indeed, through this concept, researchers in the field attempt to represent a phenomenon that is both polymorphic and multilevel. Polymorphic, in the multiplicity of forms through which the targeted phenomenon manifests (various artifacts, mental states, etc.). Multilevel, as this same phenomenon refers both to traits possessed by individuals and to elements shared by a group of individuals.

In this presentation, the different conceptions of the notion of culture within the field of cultural evolution studies will be discussed. These will be related to their uses within an evolutionary framework where the notions of transmission, heredity, reproduction, and selection are key. Their operational limits and their integrative capacity, that is to say their ability to incorporate diverse disciplinary contributions to offer an evolutionary reconstruction of cultural phenomena, will also be discussed.

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**Kao, Molly** (Université de Montréal)

*Blind analysis as coherence testing*

Experiments in high energy physics depend on generating and collecting massive amounts of data, the interpretation of which proceeds by statistical analysis. However, choices at various points of the analysis must be made, that are not uniquely dictated by the data. This opens the door to the influence of considerations that are not strictly empirical. Physicists are well aware of this issue, and utilize a variety of techniques collectively referred to as "blind analysis" to counteract possible harmful cognitive biases. Yet, the importance and applicability of these techniques can be contentious among physicists, pointing to the need for an epistemically grounded understanding of their application.

Drawing on work by Alisa Bokulich (2020), I argue that the concepts of coherence, calibration and consilience provide a framework for understanding these practices. According to Bokulich, coherence precedes calibration and consilience: it is a process whereby scientists learn from discordant lines of evidence, whereas consilience refers to a conclusion being supported from multiple independent lines of evidence. I present some of the techniques of blind analysis in order to classify their epistemic role. For instance, a "hidden signal box" result can be considered a type of coherence testing. "Redundant analyses," on the other hand, are a way of making consilience arguments. By clarifying the epistemic role of these various techniques, we can gain a better understanding of when and where they are applicable in practice.

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**Khan, Ashar** (University of Waterloo)

*Robustness as Constraint, Not Confirmation: The Case of Obesity Modelling*

Robustness is often invoked in scientific controversies as if it can deliver theory choice: if a result survives many changes in models and methods, it is taken to favour one framework over its rivals. This talk argues that the inference is frequently too strong. I use the contemporary dispute between the Energy Balance Model (EBM) and the Carbohydrate–Insulin Model (CIM) of obesity as a case study, focusing on Hall et al.’s (2022) claim that the EBM is “more robust” than the CIM. I develop a simple way to parse robustness arguments by distinguishing (i) the result said to be robust, (ii) the auxiliary assumptions varied to test its stability, and (iii) the core hypothesis that stability is supposed to support. Applied to the EBM modelling program, the key robust deliverable is a structural pattern: over the long run, energy imbalance is expressed primarily as changes in fat mass, while carbohydrate and protein stores are tightly regulated. This pattern remains stable across wide variation in modelling assumptions and recurs across distinct representational packages, supporting it as a non-negotiable constraint on adequate theories of obesity. However, I argue that this robustness does not underwrite a decisive explanatory comparison between the EBM and CIM. The same structural constraint is compatible with multiple, rival causal stories once mechanistic assumptions are allowed to vary. The philosophical upshot is a more modest role for robustness in theory disputes. Robustness can secure shared structure and constrain admissible explanations, yet, at least in this case, it falls short of licensing claims of explanatory superiority.

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**Kishchuk, Michael** (The University of British Columbia)

*Geologic Maps and the Production of Territory: A Case Study of the Yukon-Alaska Border*

Maps have long been understood to be tools of imperial power, but they are not simply representations of terrain. They are technologies which produce territory. This presentation will examine two ways that the scientific practices of geology and cartography created a national border, and the territories on either side of it, at the turn of the 20th century.

In 1887 the Government of Canada sent a surveyor and two geologists to the northwestern corner of the recently-confederated country, charging them with mapping the region’s geology and with marking the intersection of the Yukon-Alaska border with the Yukon River. The former produced a geographic inventory of mineral resources and laid the groundwork for their extraction, while also laying claim to the vertical territory of rocks at depth. Maps were also used in the more overtly political project of marking the international boundary. This process constituted a kind of reverse-mapping, in which terrain was marked to match a line drawn on a map. The Yukon-Alaska border follows the 141st meridian, an abstract entity which was imposed across existing Indigenous territories and boundaries. It was subsequently used to control the movement of these peoples, another exercise of imperial power.

By examining the use of geology in laying claim to territory and the process of imposing a cartographic boundary upon terrain, this presentation will explore two ways that maps were used as tools of Canadian state formation. Maps are not merely visualizations of spatial information, but technologies used to create, govern, and control territory.

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**Koberinski, Adam** (Western University)

*Realistic realism for effective field theories*

Effective field theories (EFTs) form the basis of our most successful theories of matter, both in particle physics and in condensed matter physics. But EFTs pose a challenge to many standard philosophical accounts of theory structure and content. In particular, the inability to cast EFTs in terms of models of precisely specified mathematical objects defined at all scales suggests that philosophical accounts of theory interpretation ought to be modified to deal with approximate, scale-relative ontologies. Building on my previous work explicating some features the world must have for the successful application of EFTs, I outline a largely pragmatist form of realism applicable to fundamental physics and beyond. The account is inspired by the failure of EFTs to fit the logical-linguistic forms of theory semantics typically assumed in realist accounts of physics. Building on Chang's (2022) critique of propositional knowledge and correspondence realism, this work brings physics more closely into contact with other scientific disciplines by rejecting both the syntactic and semantic view of theories.

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**Kojevnikov, Alexei** (The University of British Columbia)

*Space Age's Poetic Technoscience, the Second Astronomical Revolution, and the Ascendance of Big Bang Cosmology in the Soviet Union, 1955-1965*

Throughout its ancient and modern history, cosmology employed the most sophisticated mathematical apparatus and calculations, and the best available, advanced and expensive technologies of observations and instruments. Despite or because of all this, it also always involved metaphysical beliefs, wishful thinking and fundamental assumptions that, due to their generality and hypothetical extrapolations could never be fully verified. The above is also true, if less frequently discussed, of our current, generally accepted relativistic cosmological theory of the Big Bang. Its first versions appeared in the 1920s, but encountered strong resistance and took more than 40 years to gain gradual, step-by-step recognition. Einstein's theory of gravitation remained a hugely respected theory even when the number of active researchers in the field was quite small. But for many practicing physicists and astronomers, the cosmological extrapolation of general relativity appeared too speculative and dubiously scientific. This presentation will discuss the sources of those critiques and the convergence of arguments and factors – technological, observational, socio-political, and existential – which circa 1960 led the sea change in attitudes and to the widespread acceptance of Big Bang theory as a highly prestigious and popular area of research in fundamental physics, and the scientific basis for our current cosmological worldviews and further speculations.

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**Kroker, Kenton** (York University)

*Canadians Reflect on Biomedical Innovation, circa 1975*

In early March of 1975, the Montreal-based *Weekend magazine* broke a story regarding the efforts of a team of biomedical researchers to develop an "artificial pancreas," a device more commonly known as an insulin pump. In grand Canadian style, this was not a story about innovation, but rather, its opposite: the story pilloried the Medical Research Council for failing to provide the researchers (based out of Toronto's Hospital for Sick Children) to provide sufficient funding for their efforts to miniaturize the device. The story was repeated in the press throughout the first half of the year, and Canadians took note, sending

dozens of letters to politicians expressing their concerns about the situation. Many of these documents are preserved (along with the governmental response) in Library and Archives Canada. Content analysis of these materials offers a unique window into what both ordinary Canadians and their political representatives thought biomedical innovation was, what it was for, how it should be managed, and to what ends.

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**LaCroix, Travis** (Durham University)

*The Autistics and the Machines: Theory of Mind, Artificial Intelligence, and the Politics of Measurement*

Recent work in artificial intelligence claims that large language models (LLMs) exhibit theory of mind (ToM) abilities, based on their performance on classic benchmarks such as false-belief tasks. I argue that, rather than revealing emergent machine cognition, these results expose the normative, exclusionary, and linguistically biased assumptions embedded in how theory of mind has been operationalised and measured. Historically, ToM tasks emerged as proxies for social understanding and were quickly recruited to pathologise autistic cognition, framing it as a deficit relative to a neurotypical norm. The contemporary celebration of LLMs for "passing" these tests—while autistics have historically been judged to "fail" them—marks a striking inversion that calls for philosophical scrutiny.

Drawing on philosophy of measurement and critical work in the philosophy of autism, I argue that treating these benchmarks as measures of understanding commits a category mistake and rests on the illusion of a non-existent ground truth for mindreading abilities. More broadly, I situate ToM benchmarking within a ritualised culture of quantification in both psychology and AI, in which proxy measures acquire unwarranted authority and predictive success is mistaken for representational adequacy. This conflation obscures the purposes and normative commitments that shape what is taken to be measurable. In response, this paper motivates a relational and interactional reconception of understanding that resists both machine anthropomorphism and the marginalisation of cognitively diverse humans.

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**Lapierre, Marianne** (Université du Québec à Montréal)

*Consolidation de l'astrophysique au Québec : réseau d'acteurs et contributions scientifiques depuis 1970*

Autour des années 1970, une vague d'embauche de professeurs en astrophysique survient dans les universités québécoises. La consolidation de la communauté scientifique s'effectue grâce à la création de l'Observatoire du Mont-Mégantic (OMM) et au financement croissant, qui permettent le développement d'expertise en instrumentation et en exoplanètes. Ces spécialités sont propres à l'Université Laval et à l'Université de Montréal, qui collaborent et embauchent d'anciens étudiants. Tel que fréquemment constaté dans les débuts de l'institutionnalisation des disciplines académiques, la communauté est alors plutôt refermée sur elle-même, avec des lignées d'étudiants qui deviennent professeurs dans leur propre université. Cette étude s'intéresse ainsi à la consolidation de la communauté scientifique québécoise en astrophysique, en analysant sa structure, ses thèmes de recherche et son impact international. À partir d'une approche mixte combinant analyses bibliométriques et entrevues semi-dirigées, elle retrace l'évolution des collaborations, des structures institutionnelles et des pratiques de recherche. Au plan technologique, le milieu a profité de l'introduction des CCD et des ordinateurs personnels pour faciliter l'analyse plus extensive de données et communiquer avec des astrophysiciens éloignés. Les chercheurs québécois ont participé à plusieurs projets internationaux avec les États-Unis et la France grâce à leur expertise en instrumentation, quoique les collaborations restent majoritairement nationales. L'arrivée de

McGill dans les années 2000 a renforcé la visibilité du Québec, notamment dans les domaines de la cosmologie et des pulsars. L'astrophysique au Québec a ainsi bénéficié d'une expertise croissante, soutenue par des collaborations internationales et du financement gouvernemental, quoique celui-ci soit parfois fluctuant.

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**Laverdière, Yanick** (Université de Montréal)

*Les angles morts du concept de résistance dans la théorie du mouvement au milieu du XIV<sup>e</sup> siècle*

La résistance est un concept fondamental de la théorie médiévale du mouvement. Cet élément, qui gagne en importance au XIV<sup>e</sup> siècle, n'a pourtant jamais été étudié en détail par les médiévistes. Certes, plusieurs travaux l'ont effleuré en examinant la question du mouvement dans le vide ou la théorie de l'impetus, mais ceux-ci se bornent généralement à une compréhension intuitive et non détaillée.

Or, il apparaît que les médiévaux eux-mêmes ne s'entendent pas toujours au sujet des formes, des effets et des sources de résistance dans le mouvement local. En examinant les œuvres de Jean Buridan, de Nicole Oresme et d'Albert de Saxe, on remarque que ce concept n'est pas appliqué uniformément d'un bout à l'autre de leur philosophie naturelle. Dans certains cas, la résistance est immédiatement assimilée à l'idée de violence dans le mouvement, tandis qu'elle se confond d'autres fois avec la puissance naturelle, voire universelle.

Ce manque d'approfondissement de la recherche a mené Anneliese Maier à postuler l'existence d'une *inclinatio ad quietem* dans la théorie scolastique. Selon elle, tout corps aurait une tendance au repos qui résisterait à son mouvement, en plus de sa tendance au mouvement naturel. Cette lecture, qui a été régulièrement reprise dans l'historiographie, doit toutefois être rejetée. Non seulement les scolastiques ne donnent-ils aucun détail à propos d'une telle *inclinatio ad quietem*, mais ils élaborent aussi des exemples où une résistance en ce genre ne serait simplement pas applicable. Ce cas particulier met en lumière l'ambivalence du concept de résistance au milieu du XIV<sup>e</sup> siècle et surtout la mauvaise compréhension qui en résulte dans les études sur la physique médiévale.

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**Li, Fiona** (The University of British Columbia)

*Sino-Soviet Industrial Knowledge and the Development of Early Chinese Automotive Engineering: A History of Technology Transfer*

This paper conceptualizes technology transfer as a socially embedded, epistemic, and institutionally mediated process through a case study of China's First Automobile Works (Yiqi) and its collaboration with the Soviet ZiL automobile plant during the 1950s. Drawing on archival materials, factory records, and memoirs of Chinese engineers and technicians, it argues that Sino-Soviet automotive cooperation exceeded the linear transmission of machinery, designs, and technical documentation. Instead, technological knowledge circulated through embodied practices, including apprenticeship, mentorship, and routine labour on the factory floor, producing durable forms of tacit expertise that were sedimented within institutional structures and professional identities.

Against Cold War historiography that interprets the 1960 withdrawal of Soviet experts as a decisive technological rupture, this study demonstrates that the technical regimes transferred in the 1950s were actively internalized, rearticulated, and generatively transformed by Chinese engineers. Soviet automotive

knowledge thus operated not as a fixed template but as a productive epistemic resource that enabled indigenous experimentation, situated problem-solving, and innovation. By foregrounding worker-level interactions and institutional memory, the paper reconceptualizes technology transfer as a non-linear process of localization and knowledge production, challenging diffusionist models that frame socialist technological exchange as unidirectional dependence.

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**Malaterre, Christophe** (Université du Québec à Montréal)

*Origin Phenomena and Origin Explanations*

Questions about origins arise whenever we confront phenomena whose existence marks a genuine beginning. The emergence of the universe, the appearance of life, the formation of species, the rise of political movements, or the outbreak of pandemics are all cases in which there is a strong and intuitive appeal for explaining how such phenomena came into being. This raises a double question: are origin phenomena a distinctive class of phenomena, and, if so, do they require a specific mode of explanation? In this contribution, I answer both questions affirmatively. I propose that origin phenomena constitute a distinctive category, characterized by the emergence of an expanding and lasting downstream causal network. I further argue that origin explanations are a distinctive form of causal explanation insofar as they identify a bottleneck in the causal network leading to an origin phenomenon. Framing origins in these terms clarifies what sets origin explanations apart from other explanatory modes and shows how a common explanatory pattern applies to origin questions across both scientific and historical domains.

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**Lori Marino** (Whale Sanctuary Project)

*The Whale Sanctuary Project: Scholar Advocacy and Interspecies Justice*

See last two pages/voir les deux dernières pages.

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**Marino, Patricia** (University of Waterloo)

*Idealized Models, Counterfactual Reasoning, and Inductive Risk in Social Science Contexts*

This project applies concepts of inductive risk to uses of highly idealized models in social sciences. Even when they fail to capture the most relevant real world phenomena, "theoretical" models are said to be useful, e.g., for generating how-possibly explanations and helping to answer what-if questions. In the work of O'Connor and others, bargaining models are used to show that inequality arises even in the absence of direct oppression – e.g., when people bargain across groups, those in smaller groups end up worse off. In the actual world, often direct oppression causes inequality. But we learn that inequality arises counterfactually even in very "minimal conditions"; combatting the forces of inequality thus "requires constant vigilance" (O'Connor).

Epistemological evaluation of theoretical models is challenging. The models cannot be tested through empirical methods; evaluative modes such as Sugden's "credibility" rest on subjective and variable elements such as imagination, intuition, and empathy (Sjölin Wirling & Grüne-Yanoff; Marino).

I show how these challenges highlight the centrality and complexity of inductive risk for this context: what are the consequences of being mistaken? On the one hand, knowing minimal conditions is useful: if we value equality, then under-confidence in models means insufficient vigilance. But I draw on the work of historian Eli Cook to argue there are dangers overly "naturalizing inequality": such frameworks are used to push anti-progressive conclusions – e. g., that inequality is part of how things are. How we evaluate uses of theoretical models therefore depends partly on our ethical and political values.

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**Marquis-Pelletier, Raphaël** (Université de Montréal)

*Conceptualizing Populations of Organisms in Affordance Landscapes*

Levins and Lewontin (1985) famously advocated for a dialectical understanding of the organism-environment relationship: organisms do not merely inhabit environments but actively construct them. A contemporary operationalization of this idea is found in Denis Walsh's (2022; 2014) concept of affordance landscape. Departing from the traditional conception of the environment as an external, unified causal force, Walsh argues that organisms are embedded in affordances, which are possibilities for actions co-determined by both the organism and environmental features.

This organism-centred definition of the environment faces a challenge which Walsh (2022) dubs the "hyperspecificity problem": because of their intrinsic complexity and uniqueness, each organism inhabits a "different" environment. This appears to undermine the fundamental requirement of natural selection that elements on which it operates share a common environment (Brandon 1992).

By drawing on Robert Brandon's (1990) distinction between the external, ecological and the selective environment, I argue that the "overlap" between the individual organisms' affordance landscapes can be assimilated to ecological and selective environments. Conversely, the notion of affordance landscapes enriches Brandon's notion of the selective environment by integrating the dynamical and relational feature of the environment originally emphasized by Levins and Lewontin.

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**McLaughlin, Matthew** (University of Toronto)

*Mental Hygiene in the Home: How Wives and Mothers Shaped Psychiatric Expertise in 1930s America*

This presentation recovers the voices of American women who actively sought out psychiatric guidance in the early 1930s to demonstrate how their concerns and expectations influenced the psychiatrist Karl Menninger. To do so, it analyzes 360 letters Menninger received during his tenure as the mental hygiene adviser for the Ladies' Home Journal. In this role, Menninger wrote a monthly column titled "Mental Hygiene in the Home" from October 1930 to May 1932, which responded to problems submitted to him by readers of the magazine. Women throughout the United States wrote to Menninger asking for his guidance in various areas of their personal lives, including marriages, familial relationships, friendships, childcare practices, and vocations. Reviewing the letters written to Menninger illustrates how these women understood their personal experiences, emotions, and relationships, and why they regarded psychiatry as a legitimate resource for managing issues in these areas. Moreover, tracing how Menninger's column evolved in response to letters from his readership reveals the important role of non-expert readers as active participants in the consumption and production of scientific knowledge. In analyzing the ambitions of these letter writers and the direction that Menninger's column followed, this presentation will demonstrate how a psychiatrist drew heavily on his audience's concerns and desired

outcomes to inform the scope of his work and his efforts to establish psychiatry as a legitimate profession for improving people's personal lives.

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**McNickle, Gordon** (University of Guelph)

*Resolving Conceptual Indeterminacy: The Mechanistic Evolution of the Ecological Niche*

The ecological niche is a foundational concept in ecology but has been criticized for conceptual indeterminacy. I trace the concept's evolution from its beginnings as descriptive natural history to a fully mechanistic theory of coexistence. First, using Mathew Leibold's framework of the 'impact niche' (effect) and 'requirement niche' (response), I analyze the classical definitions of Elton, Grinnell, and Hutchinson. I argue that Elton emphasized species' effects, while Grinnell and Hutchinson prioritized species' responses. Next, I analyze how Peter Chesson mathematically coupled effect and response, transforming the niche into a true predictive framework. I argue that this leads to a clearer understanding of coexistence than the vague and frequently post hoc 'competitive exclusion principle' by predicting quantifiable guardrails for coexistence defined by stabilizing niche differences and equalizing fitness differences. Ultimately, I argue that conceptual ambiguity could be resolved by: (i) retaining Hutchinson's 'fundamental niche' for single-species natural history, and; (ii) adopting Chesson's mechanistic framework to replace both Hutchinson's 'realized niche' and the 'competitive exclusion principle'.

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**Meynell, Letitia** (Dalhousie University)

*The Evolutionary Implications of Recruitment in ITSNTS*

With his new evolutionary theory, ITSNTS (It's The Song Not The Singers), Ford Doolittle has introduced a non-reductionist model of evolution that suggests radical new ways of thinking about the history of life. In this presentation, I will first argue that Doolittle's own recent retreat to gene-centric models of ITSNTS is neither necessary nor desirable. Second, I will explore some of the radical implications of ITSNTS for evolutionary thinking. Central to this exploration is the concept of "recruitment." Because in ITSNTS it is the "song"—i.e., the actual function or (better yet) specific, robust, population-level causal capacities—that drives evolution, this opens up the possibility that many different species of organism can "sing" any given part of the "song". This shifts evolutionary explanations away from accounts of competing lineages of organisms (or genes) toward ways of thinking that foreground recruitment opportunities.

*The Whale Sanctuary Project: Scholar Advocacy and Interspecies Justice*

See last two pages/voir les deux dernières pages.

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**Mulchinoek, Benjamin** (The University of British Columbia)

*Indigenous-Scientific Knowledge Co-Production*

With the rise of Indigenous-scientific collaborative research, scientists are increasingly taking Indigenous origin stories seriously as evidence for scientific hypotheses. Research into the first peopling of the Americas provides one such example of this knowledge integration. In their archaeological work, Gauvreau et al. (2023) make reference to a Haíłzaqv núyḡ (Heiltsuk story) which goes: “[i]n the beginning there was nothing but water and ice, and a narrow strip of shoreline” (p. 7). The authors consider the Haíłzaqv núyḡ as evidence for one first-migration hypothesis, the coastal-migration hypothesis, over another, the Clovis-first hypothesis. This is because the núyḡ describes the Haíłzaqv traditional territory in a way that’s congruent with scientific modelling of the area as early as 18,000 years ago—a date which challenges the Clovis-first hypothesis.

However, the authors do not discuss another equally important Haíłzaqv núyḡ, which speaks of territorial presence and stewardship “since time immemorial” (Heiltsuk Tribal Council, n.d., para. 5). One might ask: why do scientists treat this first Haíłzaqv núyḡ as hypothesis-relevant evidence, but not the second? To answer this question, I turn to the recent philosophical work of David Ludwig and Charbel El-Hani (2020, 2025). These authors present the argument that (1) knowledge communities have varying degrees of epistemological, ontological, and ethical partial overlaps with other knowledge communities, and (2) it is only by attending to these partial overlaps that different knowledge communities can effectively co-produce knowledge. I argue that this framework identifies the source of tension involved with the Haíłzaqv núyḡ case: the integration of the second Haíłzaqv núyḡ with scientific evidence runs into this partial overlaps problem, where a combination of ethical, ontological, and epistemological non-overlap limits integration potential. By contrast, scientists and Haíłzaqv knowledge keepers find sufficient overlap in the case of the first Haíłzaqv núyḡ to warrant knowledge integration.

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**Nelson, Erik** (York University) & **Vlaad, Sofie** (Queen's University)

*How AI Could Undermine Scientific Objectivity*

Feminist philosophers of science argue that scientific objectivity depends upon diverse perspectives within the scientific community (e.g., Longino, 1990). A scientific community that involves diverse perspectives is much more likely to identify and critically analyze underlying biases, meaning that diverse science will be less biased and more objective (Okruhlik, 1994). In this paper, we will argue that the use of contemporary AI systems in scientific practices, such as hypothesis generation, peer review, and grant allocation (Sikimić, 2025), threatens to decrease the number of perspectives that receive input, and therefore threatens to undermine scientific objectivity. The central reason for this threat is that the same algorithms/models tend to be used across individuals and tasks, and even when algorithms/models differ, they are often trained on the same or similar data sets (Bommasani et al., 2022). This algorithmic monoculture means that the use of AI systems will likely lead to a reduction of the number of perspectives involved in scientific practices. Furthermore, empirical work has demonstrated that the evaluative outputs of large language models (LLM) are much narrower than their training inputs (Wu et al., 2024). This means that even if the training data would suggest several different (legitimate) evaluative perspectives on some matter, the model is predisposed to generate only one. This will have an impact even if the system is only being used as a consultant or a tool. Empirical research shows that solutions to creative tasks become more homogenous if participants are able to interact with an LLM during the task, even when the model being used is varied across participants (Wenger & Kenett, 2025).

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**Neswald, Elizabeth** (Brock University)

*'The Diabetic Should from the Beginning Be Made Self-Reliant': Agency and Improvisation in Diabetes Management Tools and Practices*

Even before the introduction of insulin therapy, diabetes management depended to a large degree on self-management. The range of management tasks a person with diabetes needed to master only increased afterwards. Although active participation and initiative were crucial for maintenance regimens, for much of the twentieth century, few tools were designed to specifically meet the needs of these non-professional users of healthcare equipment. Instead, people with diabetes improvised, developed domestic practices, designed their own equipment, organized, and engaged with manufacturers to get the tools they needed to support their management work. At the same time that diabetics were called upon to be self-reliant, they were warned not to become too self-reliant. Physicians and pharmaceutical companies maintained boundaries between experts and “lay” users and strove, against diabetic resistance, and eventually unsuccessfully, to reserve significant management tools for professional use.

In this paper, I look at the development of equipment and practices for diabetes self-management in the twentieth century through the lens of diabetic agency. Day-to-day self-management, especially in the early decades of the century, relied heavily on improvised arrangements. Even as domestic practices became standardized, people with diabetes had different needs and constraints than professionals, and they developed their own tools and practices to support their day-to-day management work. Finally, diabetics collaborated with, lobbied, or demonstrated potential markets to pharmaceutical companies, equipment manufacturers, and healthcare professionals, encouraging them to broaden the user base for their tools, develop patient-oriented equipment, and work with diabetic users in management tool development.

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**Ochu, Cinderella** (Harvard Medical School)

*Intimate Technologies and Feminist Critiques of Reproductive Science*

Reproductive technologies have often been presented as neutral scientific solutions to biological problems, insulated from social, political, and moral concerns. This paper challenges that framing by examining reproduction as a site where scientific knowledge, ethical reasoning, and power relations are co-produced. Drawing on feminist science and technology studies, social medicine, and reproductive justice scholarship, the paper argues that reproductive technologies such as contraception, fertility drugs, and in vitro fertilization have historically functioned as intimate technologies that both reflect and reinforce gendered, racialized, and classed hierarchies.

Focusing on the twentieth and early twenty-first centuries, the paper traces how reproductive science has circulated unevenly across Western and Global South contexts, shaped by colonial histories, religious authority, legal regimes, and global markets for care. Through comparative case studies including contraceptive trials in postcolonial Africa, the globalization of IVF, and inequities in access to assisted reproduction across sub-Saharan Africa and Western contexts, the paper shows how claims to scientific objectivity are continually challenged by feminist scholars, clinicians, and activists.

Rather than treating ethics as external to science, the paper demonstrates how moral reasoning emerges within scientific practice itself, particularly through struggles over consent, risk, access, and responsibility. By centering feminist interventions, the paper contributes to the history and philosophy of

science by showing how marginalized perspectives have reshaped understandings of scientific authority and knowledge production in reproductive medicine. It argues that reproductive justice offers a critical framework for rethinking what counts as legitimate scientific knowledge in intimate domains of life.

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**Olley, Allan** (Independent Scholar)

*Women's Place in Mid-20th Century Astronomical Computing*

Recent literature has included several accounts of extensive groups of human computers mostly women who did vital scientific and technical work in the early to mid-twentieth century. Astronomer, IBM researcher and computer pioneer Wallace J. Eckert worked with Lillian Hausman, Rebecca Karpov and Dorothy Eckert among other woman researchers and workers in close collaboration over his decades working in astronomy and computing. Their technical work while less prominent than Eckert's role as lead researcher still involved notable specialized skills and accomplishments. Mathematical astronomy was an important source of computational techniques and a model for later developments in computation. The career trajectories of these women show similarities that reflect both the social and economic gender roles of the day and the dynamics of the disciplines and techniques that would spawn modern computer technology and modern computational science. In this talk I will lay some of these patterns out drawing from both their scholarly publications and from indications in archived correspondence, interviews and later reminiscences of participants.

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**Orszak, Corey** (York University)

*A Multi Media Grope: Digital Pedagogy through Hands-On Discovery from the OISE Media Group, 1967-1973*

In 1968, the new Ontario Institute for Studies in Education (OISE) published the 1930s Kit, a “boxed” curriculum consisting of minimally contextualized, multi-media bric-a-brac from the 1930s. Students were encouraged to dump the contents of the kit onto the floor and rummage through the mess, learning about life during the Great Depression through serendipitous encounters with sensorially compelling primary source facsimiles. Yet the analog imperative of the kit and its successors, predicated on an educational potential inherent to direct interaction with different media objects, belied their origins within OISE’s Department of Computer Applications. The kits’ promise of non-deterministic, individualized, multi-media experiences might one day be duplicated at far greater scale and sophistication through computer-assisted instruction – if conscientious researchers like those at OISE received the institutional support required to further pursue their vision of mass-individuated digital education.

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**Owens, Cory** (University of Calgary)

*Thresholds for Minimal Biological Agency: Situating Prions in Teleodynamic Hierarchy*

Biological agency is characterized by the capacity of a living system to actively shape its own development, function, and maintenance through self-directed action. Non-living entities, such as prions or misfolded proteins, also display minimal agent-like behaviours in that they exhibit self-sustaining constraint dynamics. Prions utilize host mechanisms to transmit and propagate through autocatalytic

conformational self-templating, and persist through conformational strain variation over time, demonstrating selection-like dynamics. Terrence Deacon's *Incomplete Nature: How Mind Emerged from Matter* (2011) presents a hierarchical framework for examining the conditions under which agency and life emerge. Situating prions within Deacon's hierarchy reveals how minimal agential properties can emerge in biological systems from basic thermodynamic laws through constraints narrowing alternative possibilities. This analysis demonstrates graded and boundary forms of biological agency by extending teleodynamic explanations to non-genetic replication and has implications for the transition from inorganic to organic conditions at the origin of life.

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**Papale, François** (McGill University)

*ITSNTS, Energy, and the Price Equation: A Newfound Harmony for Evolutionary Thinking*

Evolution is often defined as change in the distribution of heritable variation within a population and across time. This sits poorly with various phenomena, such as growth or persistence, through which biological entities fail to increase their ratio in a population and, as a result, cannot be said to be fit according to standard evolutionary thinking. Some songs, identified by "It's the song, not the singer" theory as central players in evolutionary dynamics, are good examples of this: biogeochemical cycles maintain themselves or grow, yet often fail to reproduce. My objective in this presentation is to offer a new version of the Price equation that allows conceiving of these songs, and growth more broadly, as being fit. To do so, I tie growth to increase in energy control (Van Valen 1976). This theoretical move has the potential to bridge the gap between ITSNTS and standard evolutionary thinking.

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**Park, Hyung Wook** (Nanyang Technological University)

*Curious Immunosuppression: Rejection and Other Problems of Organ Transplantation, 1960-1990*

Focusing on the American surgeon Thomas E. Starzl's work for the world's first liver transplantation, I discuss how he reshaped the studies of immunological "tolerance" after the work of two Nobel laureates, Frank Macfarlane Burnet and Peter Medawar. Following their work, Starzl investigated how chemical immunosuppression, which patients must take perpetually, could prevent transplanted livers' rejection. Yet the immunosuppressants weakened the body's defense against pathogens. Moreover, he often could not distinguish organ rejection from infection, immunosuppressants' side effects, and surgical mistakes. If a liver transplant failed, was it due to immunological rejection, immunosuppression-induced infection, or its other side effects? Or was it because of the lack of surgical skill? Unable to answer these questions, Starzl could not delineate the boundary of the immunological self or induce tolerance. I show that this issue saw an unexpected partial resolution after 1980. Then, some of his patients stopped their immunosuppressants, because of high prices and no insurance coverage. Others faced difficult life courses, including divorce and unemployment, which hampered regular immunosuppressant intake. Surprisingly, many of these patients stayed healthy, implying that their bodies "tolerated" transplanted organs. As organs were not rejected, there was no need to distinguish rejection from other mishaps. Their bodies also had no problem of defense against pathogens. Admittedly, it was hard to determine under what conditions this tolerance developed; few transplant surgeons could thus recommend immunosuppressant withdrawal. However, this phenomenon suggested that human bodies could accommodate genetically distinct tissues, implying a mode of tolerance that had not been studied by Burnet, Medawar, or others. Patients' bodies, not doctors' work, opened new lines of immunological investigation. This paper will deepen our understanding of transplantation since Susan Lederer and

Thomas Schlich as well as the history and philosophy of immunology pursued by Thomas Pradeu, Bartłomiej Swiatczak, and Alfred Tauber.

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**Paron, Clarisse** (Dalhousie University)

*Food Noise and the Mad Fight Against Ozempic*

Sensationally touted as a “miracle drug,” semaglutides like Ozempic have received praise for their application in treating “obesity.” Initially used to regulate blood sugar in type 2 diabetes, semaglutides have since been approved as a weight loss medication. While some scholars have critiqued these pharmaceuticals for redefining a ‘normal’ (ideal) body type and perpetuating unachievable beauty standards, this paper identifies how the use of semaglutides for weight loss also problematically pathologizes particular mental states. Anecdotal reports on social media from patients who take semaglutides and their physicians claim that semaglutides have a positive side effect of quieting a user’s “food noise.” Food noise, the “intrusive and unpleasant...constant preoccupation with food-related decisions,” has garnered attention in the literature, with researchers attempting to measure and understand why “obese” patients experience more food noise than their weight normative counterparts. These reports describe how semaglutides quiet food noise, thereby allowing patients to adhere to their diets more successfully.

I argue that the discussion around food noise reveals how systems of mad oppression (saneism) are interwoven with size oppression (fatphobia), thereby naturalizing weight gain as a mental disorder one is responsible for controlling and attempting to cure. The sharing of semaglutide experiences on social media have pathologized a biologically adaptive mental state since the mental state 'interferes' with one's productivity in a capitalistic, neoliberal society. Although listening to patient reports often help combat epistemic injustice in healthcare, in this case, patient reports based on internalized oppression and harmful weight loss culture should not be epistemically trusted as a basis for medical research. This paper argues that medical researchers should evaluate the harmful values that guide their research questions, such as fatphobia, and how their research may further oppress those in non-normative bodies.

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**Prosper, Aaron** (Dalhousie University)

*A Comprehensive Appraisal of the Application of Two-Eyed Seeing in Health Services Research: An Integrative Review*

Background: Since its introduction into academia in 2004, the concept of *etuamptmumk*, or Two-Eyed Seeing (E/TES) has gained significant traction across many aspects of Canada's science landscape, including health services research. While the expansion of E/TES has been welcomed by many, there has also been concerns regarding the tokenization and co-optation of the concept (Roher et al., 2021; Roher et al., 2024). To date, there has been no comprehensive review of literature which examines ways in which E/TES is applied in the context of health services research.

Purpose: The purpose of this study is to review current literature to understand the ways in which E/TES is applied in the context of health services research in Canada.

Methods: This integrative review was guided by the five-stage approach outlined by Whitemore and Knafl (2005). Following a search of the literature a total of 401 articles were reviewed from six databases,

yielding 27 articles which were included for final data analysis. Data were extracted, analyzed, and synthesized.

Results: Seven main themes were identified regarding the ways in which E/TES is applied in health services research, which included: 1) inconsistent descriptions and applications of Two-Eyed Seeing; 2) limited use, description, and application of ‘co-learning’; 3) limited use, description, and application of Indigenous methodologies in study designs; 4) overemphasis of Western methodologies and research practices; 5) community-informed research; 6) consideration of Indigenous-based ethics and research protocols; and 7) Indigenous-specific considerations in health services. Several subthemes from the seven themes are also described.

Conclusion: This thesis is the first comprehensive review of literature to focus on the application of E/TES in health services research. Demonstrating various inconsistencies in the ways in which researchers have applied E/TES, this thesis discusses the implications of these themes in detail and concludes with a series of considerations for researchers.

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**Pryce-Digby, Rosemary** (University of King’s College)

*Canada’s Atomic Time: Scientific Sovereignty and Interdependence amid Cold War Militarization*

This paper explores the Canadian cultural, political, and militaristic context of the invention of the atomic clock during the Cold War and beyond. Precise timekeeping has been intertwined with military incentives for centuries, and the atomic clock furthers this connection. The clock allowed for precise missile guidance, accurate navigation, and eventually led to the invention of global navigation satellite systems. The device, since its creation, has aided in precision warfare. Focusing on the Canadian history, this paper examines the push for national scientific sovereignty at a time of extreme political tension. However, the development of atomic clocks and Coordinated Universal Time (UTC) relied on vast scientific and technological cooperation between countries. The first atomic clocks were invented at the beginning of the Cold War with cross references between American, British, and Canadian physicists. By 1967, the second had been universally redefined in the International System of Units. To this day, many of the official National Research Council Canada clocks which tick Canada’s time are American and Russian built. Ultimately, the Canadian history of the atomic clock highlights the techno-scientific interdependence among nations, even in the face of imminent warfare.

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**Reynolds, Andrew** (Cape Breton University)

*Trogocytosis: A Cell Behaviour Twice Discovered*

Élie Metchnikoff received the Nobel Prize in Physiology or Medicine in 1908 for his description of phagocytosis of foreign pathogens by metazoan white blood cells. This immune function relies on a striking resemblance between white blood cells and unicellular amoebae, both of which use pseudopodia to crawl, hunt, and consume other cells.

Trogocytosis is a form of phagocytosis discovered and identically named twice independently; first in 1978 by the British medical microbiologist Thomas Brown (University of Aberdeen) in the amoeboflagellate *Naegleria fowleri* and again in 2002 by Denis Hudrisier and Etienne Joly (University of Toulouse) in lymphocytes. ‘Trogocytosis’ (from Greek for cell nibbling) was chosen twice independently

as the appropriate name for this behaviour by which a cell ‘bites off’ a piece of the plasma membrane of another cell, in contrast to phagocytosis whereby an entire cell is engulfed within another’s pseudopodia. Trophocytosis serves multiple functions: *N. fowleri*, the causative agent of ‘brain-eating amoeba’ disease, uses it to cloak itself in host cell membrane proteins and thereby avoid detection and destruction by lymphocytes and other white blood cells; microglia, resident immune cells in the central nervous system, use it to ‘prune’ neuronal synapses, sculpt neuronal circuits; they and other leukocytes use it to kill pathogens, infected neurons, and cancer cells.

What methods were used to recognize this phenomenon in the two distinct investigations? What questions framed its recognition? What might this case of convergent discovery teach us about discovery in cell and molecular biology and of human evolution?

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**Rich, Kaitlyn** (Rutgers University)

*Lost in the Stacks: A Case Study of Rutgers University Alexander Library and Iron Mountain*

In September 2021, Hurricane Ida flooded Rutgers University’s Alexander Library, forcing the relocation of over 80% of Rutgers University Archives and Special Collections. Artifacts, including Late Kingdom mummified cat remains, medieval manuscripts, and vital regional newspapers, were relocated to off-site warehouses owned by the private information management company, Iron Mountain. Years later, these items remain in private storage with no plan for return. The collection now faces new risks; delicate artifacts are subjected to wear during transit, while others remain “lost” or inaccessible within the Iron Mountain stacks. Through ten interviews with current, former, and retired Rutgers University Alexander Library archivists, librarians, and staff, this paper examines how library workers at a public R1 research institution navigate the affective and material consequences of off-site storage. As holdings become geographically remote, difficult to access, and vulnerable to transit damage, library professionals face a destabilized work environment characterized by a loss of curatorial agency and reduced resources for programming. Utilizing a critical feminist social study of science and technology (STS) framework, this research situates the Rutgers case within a larger landscape of compounding stressors on public memory infrastructure. The climate crisis poses both a threat to cultural heritage and a capitalization opportunity for private companies. The increasing encroachment of private, for-profit information management companies, platformization, digitization, and private storage is often framed as a logistical and efficiency-driven solution for underfunded and resource-strapped public archives and memory institutions. However, this research highlights the fundamental value misalignment between the profit-driven motives of service providers and the preservation-focused mission of public academic libraries. Through the first-hand experience of library workers, I examine the long-term impacts of disaster-driven privatization, revealing that by ceding skills, knowledge, and physical stewardship to private companies, higher education institutions risk eroding their own institutional viability and the integrity of collective cultural memory.

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**Roberts, Michael** (York University)

*The Object as Discipline: Engineering training in late 19th and early 20th century Ontario*

In 19th Century Ontario, the state and elite reformers provided farming training through a system of Mechanics Institutes. Farmers largely ignored the training but relied heavily on the institutes as public libraries – spaces of autodidacticism. Reformers chalked this up to “backwardness” and a lack of

progressivism, but the farmers were actually deeply progressive and engaged in their own distinctive learning communities. Farmer-engineers, in particular, developed scientific and technical knowledge that exceeded the understanding of academic experts. Apprenticeship and self study both made the object (the engine itself) central to the process of learning. In this paper I argue that curriculum was not necessary in the context of engineering training. The engines themselves provided a disciplining force that kept learners on track and prevented the development of false beliefs and perverse understandings. It was, in fact, the intense desire of farmer-engineers to learn which caused them to reject classroom-based curricular approaches, and to develop their own text-based community of teaching and learning practice to complement direct apprenticeship.

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**Romagni, Domenica** (Colorado State University)

*Kepler, Mersenne, and Musical Consonance: The Role of Observation and Analogy in Early Modern Explanation*

Marin Mersenne and Johannes Kepler are both lauded for making significant contributions to early modern natural philosophy, which are often attributed to the emphasis they placed on careful empirical observation. And, while it is true that both figures were fastidious in their attention to empirical data, there was a significant amount of disagreement between them regarding exactly how much weight should be placed on observation and how observations should be synthesized into natural philosophical explanation. In this paper, I will focus on their disagreement on the explanation of musical harmony. I choose this example for two reasons. The first is because, despite being a topic that some today might consider strictly ‘aesthetic’, both Kepler and Mersenne shared the belief that music theory was key to understanding other branches of science and mathematics. The second is because Kepler and Mersenne’s discussions of the topic directly leverage empirical observations to build explanations of musical consonance in a way that highlights distinct differences in methodology in early modern natural philosophy. In the paper, I argue that Mersenne’s rejection of Kepler’s account of musical consonance is due to disagreement on how empirical observation should be combined with mathematical analysis and, more broadly, when and how analogical evidence is legitimate in scientific inquiry. I begin by outlining context about early modern music theory and its situation as a mathematical science at the time. I then provide an overview of Kepler and Mersenne’s respective theories and the disagreement between them, arguing that it is not a matter of changing paradigms or differences in ontological commitments, but rather a disagreement on the application of mathematics and analogical reasoning. I conclude with some remarks on how this under-discussed debate can shed light on theory-building in the early modern period.

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**Saberi, Farid** (Western University)

*How to Relate Allocation and Transition Theories in the Evolution of Brains: A Case Against Evolutionary Extrapolationism*

Research on brain and cognitive evolution shows both revolutionary and conservative phases. Revolutionary phases involve structural changes enabling new forms of cognitive evolvability, while conservative phases feature neural reuse—reallocating existing resources for novel functions while preserving a generic and developmentally plastic brain. I call theories addressing revolutionary phases transition theories, and those addressing conservative phases allocation theories. The relation between the two has been explained through a form of evolutionary gradualism and extrapolationism: Allocation mechanisms (from selection in the gene pool of populations to developmental and neural selection), over

long geological time, scale into patterns of increasing cognitive fitness, driving lineages toward new modes of cognition and major cognitive transitions. This paper challenges this view. I argue that (1) allocation mechanisms reflect microevolutionary selective processes, while major cognitive transitions are macroevolutionary phenomena; (2) cognitive transitions are best understood as a passive large-scale evolutionary trend which occurs in a heterogeneous regime of evolutionary forces; therefore, micro-level selection cannot be extrapolated to explain a macro-level phenomenon. Thus, while allocation makes brains more adaptive, it is insufficient to explain cognitive transitions. Contingency and selective pressures in directions other than increasing cognitive fitness are also central. Finally, I discuss how rejecting extrapolationism weakens gradualist, adaptationist accounts of brain evolution, reopening the possibility—echoing S. J. Gould and N. Chomsky—that certain cognitive structures, like language, may be complex and novel yet not narrowly shaped by adaptive demands.

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**Schneider, Emily** (University of Calgary)

*Explaining the Emergence of Transmissible Cancer: Rethinking the Genetic Paradigm Through Goal-Oriented Concepts*

Cancer is typically understood as a disease involving uncontrolled cellular proliferation within a single organism. Yet, the discovery of transmissible cancer lineages such as Devil Facial Tumour Disease (DFT1 and DFT2) exhibited in Tasmanian Devils challenges this assumption by demonstrating that malignant cell lines can spread between individuals. This raises a central question: does the discovery of transmissible cancer urge us to reframe the genetic paradigm in explaining how cancer originates? This paper evaluates the extent to which existing explanations capture the phenomenon and argues that to sufficiently explain the emergence of transmissible cancer, we ought to shift our perspective from gene-centric to the lineage-level. This move is contentious, as explaining DFT at lineage-level invokes goal-oriented concepts that are strongly rejected in mechanistic explanations.

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**Sirbu, Renée Andrea** (University of Toronto)

*The Immortal You™: Metaphysical Assumptions of the Digital Afterlife Industry*

Companies like Replika and HereAfter AI promise “digital immortality” through postmortem avatars—AI-driven “deadbots” that simulate the deceased using preserved personal data. These digital doubles can continue interacting with grieving loved ones, ostensibly preserving something essential about the person who has died. The popularity of such technologies, alongside cultural fascination with “mind uploading” in media like Black Mirror and Upload, suggests widespread sympathy for the idea that digital immortality is genuinely possible. But what metaphysical commitments underlie this promise, and are they defensible?

In this paper, I argue that the digital afterlife industry (DAI) implicitly relies on a neo-Cartesian framework that cannot withstand philosophical scrutiny. Specifically, I contend that the DAI’s promise presupposes something like the computational theory of mind (CTM), which treats the mind as “software” running on the “hardware” of the brain—and, by extension, as substrate-independent and transferable to digital systems. This computational analogy perpetuates the Cartesian legacy of mind-body dualism in technological guise, promising immaterial immortality through digital means.

Drawing on situated cognition theories—the “4E” framework of embodied, embedded, extended, and enacted cognition—I challenge the metaphysical assumptions underlying the DAI’s promise. These approaches reject the substrate-independence thesis central to CTM, emphasizing instead the constitutive role of embodiment and environmental embedding in cognition and selfhood. On this view, seemingly immaterial aspects of the self cannot exist independently of their physical instantiation. There is no digital self without a material anchor—and crucially, whatever persists through a deadbot is not you in any philosophically meaningful sense. The promise of digital immortality, I conclude, rests on a metaphysical error.

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**Snobelen, Stephen** (University of King’s College)

*From Engineering to Reverse-Engineering: The Pre-History, History and Future of the Bentall Procedure in Heart Surgery*

Until the 1950s, medical science could do little to correct aneurysms of the ascending aorta or bicuspid aortic valves, two pathologies now known to manifest the same connective tissue disorder. In 1968 at London’s Hammersmith Hospital, Bentall and De Bono repaired a diseased aortic valve and concomitant aneurysm by implanting a ball-and-cage valve, resecting the aorta and replacing it with a Dacron conduit. Since then, variations of this operation have saved tens of thousands of lives around the world. Beginning with the ancient Greeks and concluding with modern genetics, this paper shows that over time there has been a perceptible shift from artificiality towards naturalisation in the refinement of the Bentall Procedure and its clinical antecedents.

In the 1940s surgeons attempted to correct aortic aneurysms with cellophane wraps. In the 1950s DeBakey and Cooley began replacing aneurysms of the ascending aorta with homografts and soon thereafter pioneered the use of knitted Dacron conduits in arterial repair. Mechanical heart valves arrived in the 1950s and the treatment of aneurysms and diseased aortic valves converged in the Bentall Procedure. Subsequently, bovine pericardial and porcine tissue valves were developed, leading to the Bio-Bentall Procedure. Tissue valves better replicate the hemodynamics of the native valve and usually eliminate the need for blood-thinners, but deteriorate and calcify over time. The ideal treatment is not yet here. In the future, tissue-engineering will create both valve and aorta by populating collagen scaffolds in bio-reactors with the patient’s stem cells.

While early attempts to correct aortic aneurysms and diseased valves are characterised by the use of synthetic materials and unnatural designs, the trajectory is towards reverse-engineering as medicine reaches for a solution that recreates the precise design and fabric of Nature.

Full disclosure: the author underwent a successful Bio-Bentall Procedure at the Halifax Infirmary on 12 November 2015.

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**tMannetje, Jacob** (University of Ottawa)

*Why we have no ‘Blind Spot’: Merleau-Ponty’s Phenomenology of Sight as Model of Knowledge*

In *The Blind Spot* (2024) Frank et al argue that there is a tendency to equate scientific objectivity with an omniscient view of reality which neglects the role of subjective experience in making possible that view. Subjective experience both escapes and makes possible the scientific gaze. Frank et al deploy as analogy

the blind spot in our visual field incurred by the optic nerve which makes vision possible. Their critique stems in part from a phenomenology of vision. As Evan Thompson illustrates in his earlier work *Mind in Life* (2007) interpreting our visual blind spot to be a gap in our visual field which we mistakenly take to be complete misunderstands the intentional structure of sight. Our visual field is not a picture with a dead pixel, but an intentionally complex disclosure of the world to embodied beings –it is temporally extended and highly integrated with our sensorimotor capacities. Doing justice to the intentional structures of sight reveals that, in a very real sense, sight does not have the blind spot of the visual-field-taken-as-picture. Maurice Merleau-Ponty (1908-1961) thought deeply on the nature of sight, from his *Phénoménologie de la perception* (1945) to his final publication “L’Oeil et l’esprit” (1960), he saw in sight something ambidextrous which both sees and is seen. Merleau-Ponty’s phenomenology of vision offers a rich starting place for a model of investigative knowledge that is able to maintain the integrity of the scientific view while remaining sensitive to the critique of The Blind Spot.

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**Travisano, Michael** (University of Minnesota)

*Investigating Agency in Experimental Evolution*

A case study of recent work in experimental evolution will be used to investigate agency in natural selection. Travisano’s experiments investigate the dynamics of the evolutionary transition from unicellularity to multicellularity. This paper will use this experimental system to identify three kinds of agency: goal-directed agency exercised by individual yeast; intentional agency exercised by human experimenters who set up environments (in test tubes); and selective agency exercised by the materials within those flasks. Selective agency in the tubes guided evolution in a new direction (towards multicellularity), parallels the selective agency exercised by humans in artificial selection.

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**Valiquette, Matthew** (McGill University)

*Towards a Culture of Predictive Quantification: Value-Capture in Machine-Learning*

In the philosophical literature, value-capture refers to cases where technological artifacts present us with narrow versions of our values that, due to their seductive clarity, come to dominate our practical reasoning (Nguyen, 2025). The notion draws from literature in sociology on reactivity, i.e., how people react to being measured (Espeland & Sauder, 2007). Recently, authors have discussed reactivity for technological forms of measurement (König et al., 2022), echoing discussions in machine-learning concerning effects of predictive algorithms on human behaviour (Passi and Barocas, 2019). However, few discuss in what sense machine-learning poses a distinctive threat vis-à-vis value-capture. This paper argues that, by design, machine-learning risks exacerbating the seductions and harms of value-capture, by emboldening the mechanisms by which reactivity operates. The first section argues that the computational features of predictive algorithms require more rigid demands of quantification that: 1) encourage people to adapt their behaviours towards values aligned with statistical analysis; while 2) relocating attention towards increasingly simplistic outputs (Green and Chen, 2019, Grote and Berens, 2020). Models require using proxies that are increasingly distant from nuanced understandings of target attributes (Passi & Barocas, 2019), while opacity encourages deference and alignment with the conceptual standards of statistical analysis (Grote & Berens, 2019). Yet, even making models explainable can render outputs deceptively simple, promoting undue trustworthiness (Ehsan et al., 2024). The second section argues that these same features risk increasing the harms and seduction of value-capture. The inferential distance of proxies creates increasingly narrow outputs that fail to capture the richness of human experience (Guerdan et al.,

2023). The opacity of models undermines control over the formation of personal values, whereas explainability promises seductive clarity in place of understanding. Last, institutional interests in predictive algorithms promote statistical notions of fairness, accuracy, and bias, while distracting from human centred-understandings (Grote & Keeling, 2022).

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**Varón Echeverri, Sara** (Western University)

*How to Evaluate Climate Multi-Model Ensembles: Between a Social and a Scientific Perspective*

According to Jasanoff (2010), the abstract of climate science results in the lack of connection with local systems of meaning and so it poses fundamental obstacles for motivating climate action. Unlike other natural sciences, climate science relies on the experiences and testimonies of actors who play a part on the measuring and data collection. Like Parker's (2024) "storylines" in the categorization of data while making models, Jasanoff describes that the variety of ways in which these phenomena is experienced does not allow for a universal "climate action". In Jasanoff's (2021) words, local communities have civic knowledge, not universal knowledge. This knowledge is informed by how the community has been directly affected by climate change, by the political values and priorities they set, how they see their immediate material world and how they have seen this world change. Like Kitcher's (2011) description of the democratization of science, communities have restricted knowledge based on the information available to them. This is not to say that what we need more scientific communication. We have sufficed the pedagogical gap, we've showed others experiences outside of their immediate lived experiences. How can we overcome these obstacles and challenges and motivate climate action?

I suggest that it is possible to motivate climate action, not by communicating more information, but by demonstrating how civic knowledge correlates with climate predictions. An adequate model, in Parker's (2011) sense, will answer why individuals trust science and its evidence, how authority is built, and how knowledge might affect the local realities of the people in question. Moreover, a model that successfully explains something through civic knowledge should successfully engage with the public and, possibly, motivate action. This suffices other requirements of public-facing-science from authors like Winsberg and Harvard (2024) who have suggested that participatory mechanisms in knowledge gives this knowledge authority.

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**Virdi, Jai** (University of Victoria)

*Hormonal Risk: Developing Endometriosis Treatments During the Pharmaceutical Gold Rush*

In 2005, the U.S. Food and Drug Administration approved Pfizer's depo-subQ provera 104, a reformulated version of Depo-Provera, as a treatment for endometriosis. Promoted as the "first new treatment" in fifteen years, this approval obscured the drug's longer and more contested history. Developed by the Upjohn Company in the late 1950s, Depo-Provera was first approved in 1960 to treat endometriosis and threatened miscarriage, based on safety rather than demonstrated efficacy. Subsequent trials revealed its contraceptive potential, redirecting regulatory and marketing priorities and marginalizing its role in endometriosis care. This paper situates Depo-Provera's development as an early progestin-based therapy within the broader history of reproductive health, sterility, and hormone research, showing how gynecological debates and eugenic ideas intersected with the rise of pharmaceutical modernity.

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**Waters, C. Kenneth** (University of Calgary)

*Investigating Agency from a Jamesian Perspective: Agency in Artificial Selection*

Agency has recently become a lively topic in biology. Philosophers of biology have contributed by developing and applying ideas about the nature or essence of biological agency. This talk will begin by suggesting that agency in biology can be investigated along the lines that William James proposed investigating mental phenomena in (*Principles of Psychology* 1890). James said that scientists should not theorize about the nature or essential features of mental states (that is a task for metaphysics). Instead, psychology should investigate “the conditions antecedent to mental states” and their “resultant consequences”. Likewise, a biological science of agency need not theorize about the nature or essential features of agency. Instead, biologists can learn about agency by investigating how agency arises and evolves. The second part of this talk will illustrate how philosophers can contribute to this work by using Darwin’s account of artificial selection to characterize conditions of selective agency.

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**Wayne, Andrew** (University of Guelph)

*Explanation in physics: beyond theoretical context*

Recent accounts of explanation in physics emphasize the role of theoretical context. Work by Lina Jansson, Marc Lange, and other proponents of idealized model explanations develop distinct versions of theoretical contextualism, but they share a common assumption: they limit the role of context to relevant high-level theory. For example, on Jansson’s account explanatory generalizations must be licensed by higher-level laws; for Lange, properties appearing in explanatory generalizations must be “natural” in the theoretical context.

This talk argues that the role of contextual factors needs to be expanded. I examine two cases from physics that show what additional context is needed. First, I respond to Lange’s argument that Archimedes’ principle is explanatory in the context of energy conservation but not in the context of hydrodynamics. I argue that the principle is widely regarded as explanatory in hydrodynamics, and rightly so because it supports the counterfactual reasoning required for intervention and manipulation, which are key goals in that discipline.

Second, I examine a recent approach to modeling gravitational waves using effective field theory (EFT) models. In this case as well, even though EFT models are not supported by theoretical context—indeed they employ quantum-like assumptions that are physically impossible in general relativity—physicists rightly treat them as genuinely explanatory because they provide understanding through cross-disciplinary unification.

These cases demonstrate that what counts as explanatory depends not only on theoretical context but also on how explanations serve other scientific goals prioritized within particular research communities.

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**Williams, Cassandra** (University of Toronto)

*Would I Still Have Attention If I Was A Worm?*

I argue that the motivational trade-offs paradigm proves that *C. elegans*, a microscopic worm with 302 neurons, has attention: the psychological capacity to impose a priority ordering on its mental life to facilitate flexible behaviour.

§1 explains the motivational trade-offs paradigm: organisms with competing motivations are able to prioritize one motivation over another in order to achieve optimal behaviour.

§2 considers the evidence that *C. elegans* exemplifies motivational trade-offs, and argues that motivational trade-offs amount to evidence that *C. elegans* exemplifies attention. I consider both the neural realizer (gain modulation) and the functional role (prioritization for action) of the process underlying trade-off behaviour, to argue that this process should be countenanced as attention. I then argue that this entails *C. elegans* exemplifies behavioural flexibility: its behaviour is not a mere reflex response, rather attention affords the organism a kind of flexible behavioural control often thought to be restricted to animals with more sophisticated cognitive abilities.

In light of *C. elegans*'s behavioural flexibility, we need new resources to understand how this kind of flexible behaviour is possible without cognition. I conclude by considering how we might revise the study of animal minds in light of this situation.

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**Wilks, Larissa** (University of Calgary)

*Charges of Anthropomorphism in Debates about Biological Agency*

Critics of the new literature on biological agency often defend their skepticism by pointing out that humans have a psychological bias towards attributing human capacities to other organisms (or entities) without having sufficient evidence. In this paper, I will examine how critics of the agency perspective in biology charge that anthropomorphic bias is the basis of the agency perspective and evaluate whether this charge is legitimate or useful. I will argue that although the focus on anthropomorphic bias is prominent in the literature on agency, the presence of anthropocentric bias in this literature has not received sufficient attention. I will show that charges of anthropomorphism in this literature exhibit a harmful anthropocentric bias; critics' understanding of agency is unreasonably centered around the human manifestation of agency. Because charges of anthropomorphism presuppose unreasonable anthropocentric background assumptions, they are not warranted in debates about biological agency.

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**Winsor, Polly** (University of Toronto)

*Who Should We Credit for the Concept of Homology, and Why Should You Care?*

Biology textbooks, if they discuss homology, usually cite Richard Owen's definition, often illustrated with diagrams comparing a human arm, bird's wing, bat's wing, and the paddle of some marine mammal. A longer text may add Aristotle, citing his line comparing a fish's scale to a bird's feather, although he meant to show analogy rather than homology. On this topic is rare to find any mention of Carl Linnaeus, an Enlightenment man whose full-time job was comparing the parts of a plant to the parts of another plant.

When writers on the history of morphology mention botany, they begin with Goethe and jump to Agnes Arber. Yet with respect to biological ideas, it is remarkably easy to show that Linnaeus has a strong claim to being one of the most important figures in the history of the concept of homology. A related question ought to concern everyone who cares about the intersection of the philosophy of science with history: so what? Why does it matter that biologists routinely neglect botany, and that most literature supposedly about biology, the history of biology, and the philosophy of biology refers solely to animals? The short answer is that truth matters. More accurate history is a better source for understanding current problems than is distorted history. A longer answer should include several ways in which plants are fundamentally different sorts of creatures than animals are.

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**Wright, Aaron Sidney** (Dalhousie University/University of King's College)

*Epidemiological Cohorts and Political Epistemic Objects*

A cohort is a type of epidemiological study population, for example a group that has been exposed to a toxin, whose health is then surveilled by scientists. Scholars have drawn attention to the role of cohort studies as infrastructures of epidemiological knowledge (Susanne Bauer), and their interaction with gendered labour and nationalist politics (Christine Holmberg). The famous Framingham Heart Study shaped the meaning of risk assessments and evidence-based medicine (Élodie Giroux). The Framingham study is ongoing, and as such new data are added to the cohort. But excepting this expected case, this literature takes it that the primary data of the cohort remain fixed. The initial medical examinations and membership does not change. In this paper, I use the example of the Beaverlodge Cohort to demonstrate that cohorts are more fluid entities, akin to Hans-Jörg Rheinberger's laboratory "epistemic objects." The Beaverlodge cohort was assembled from the health and labour records of uranium miners from Saskatchewan's Athabasca region who were exposed to Radon gas, which causes lung cancer. It is considered among the best global evidence for setting international radiation safety standards, not only for mining, but also for environment and domestic exposures. Initially, the 1980s Beaverlodge studies showed that radon was much deadlier than expected. However, after the initial studies, scientists, bureaucrats, and consultants made repeated efforts to recalculate, revise, and reconstitute the exposure levels and cohort composition. The nature of this epistemic object was, I argue, quite directly shaped by the political economy of uranium mining and radiation safety.

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**Wylie, Alison** (The University of British Columbia)

*Ethics from the Ground Up: The CBIKS Ethics Co-lab and "Materializing Indigenous Histories"*

What is required to "braid" Indigenous knowledge and science ethically – in ways that are not extractive, that enhance the rigour and robustness of research practice and its outcomes, and that centre the interests and goals of Indigenous scholars and their communities? This cluster of questions has been central to two research programs: the 2021-2025 SSHRC-funded partnership project, "Materializing Indigenous Histories" (MIH) that brings together four collaborative partnerships between Indigenous communities and archaeologists in western Canada, and the Centre for Braiding Indigenous Knowledges and Science (CBIKS), established in 2023 with funding from the U.S. National Science Foundation. It has been a foundational commitment of both MIH and CBIKS to make reflection on the ethical dimensions of collaborative practice a central focus of inquiry, alongside the primary research projects they support in the areas of archaeology (MIH), and cultural heritage, climate change, and food sovereignty (CBIKS). The orienting values that inform these projects are distinctive both in content and in the "ground up"

processes by which they have been articulated as guidelines for collaborative research. I consider how they diverge from mainstream research ethics, and how they align with the “partial overlaps” framework for such work outlined by Ludwig and El-Hani in *Transformative Transdisciplinary* (2025).

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### **June 9 Hybrid CSWIP & CSHPS Symposium: "The Whale Sanctuary Project: Scholar Advocacy and Interspecies Justice"**

In 2019, the Government of Canada passed the "Ending the Captivity of Whales and Dolphins Act". It prohibits the taking of cetaceans into captivity, and requires permits for importing or exporting cetaceans. It is now a criminal offence to use or display cetaceans for entertainment purposes. However, there are exceptions to the ban on cetacean captivity. These include using captive cetaceans for scientific research, or even for entertainment if a licence is obtained from a provincial Lieutenant Governor. Further, any cetaceans in captivity at the passing of the bill are 'grandfathered' so their owners are permitted to keep them captive for the rest of their lives, but not force them to perform. In Canada, there are approximately 30 belugas and 4 bottlenose dolphins remaining in captivity at Marineland, Niagara Falls. The contentious theme park closed in 2024 and now wants to offload the animals at its park, including the whales and dolphins.

France has recently passed a similar law ending the captivity of cetaceans. Marineland Antibes is also looking to offload its last two orcas in captivity, Wikie and Keijo, who are mother and son. After proclaiming that the Port Hilford Whale Sanctuary is the most responsible and ethical option for Wikie and Keijo, the French Government announced that instead they will allow their transfer to a similar aquarium in Spain. These cetaceans are among the more than 3000 that remain in captivity in the world. Some governments are certainly doing the right thing in legislating an end to the cruel practices of cetacean captivity, but there exists a lacuna between policy and practice. What justice is owed to the non-human animals we humans have treated so badly, and how might we implement reparations?

The CSWIP/CSHPS panel will present and workshop the problems and solutions for achieving interspecies justice, including the roles of scholar advocacy.

**Dr. Lori Marino** will speak about the 100-acre ocean sanctuary at Port Hilford, Nova Scotia. It is the first of its kind in the world and aims to be ready to receive its first residents this year. Marino is an internationally renowned neuroscientist, whose research includes the evolution of the brain and intelligence in cetaceans, primates and farmed animals. Her expertise includes issues in marine mammal captivity, such as dolphin assisted therapy, and the educational and science claims of the zoo and aquarium industry. She is the founder and executive director of The Kimmela Center for Animal Advocacy, which focuses on bridging the gap between academic scholarship and praxes in animal advocacy.

**Dr. Letitia Meynell** will put sanctuaries and species inclusive justice in conversation with feminist philosophy. Scholar advocacy has long been a part of feminist praxis. Meynell will investigate what it means to make that praxis species inclusive. Importantly, moving individuals from entertainment-based, for-profit aquaria to non-profit sanctuaries changes our relationships with them. Seeing them as exploitable, fungible objects is transformed to seeing them as vulnerable particular others, to whom we have obligations. This transformative power makes

projects like WSP radically important, but it also explains the resistance that such projects face. Such resistance lays bare the lacuna that exists in interspecies justice. The thirty belugas languishing at Marineland and the two orcas being trafficked to another concrete tank are particular others to whom we humans owe species inclusive justice.

**Dr. Andrew Fenton** will show how species-inclusive ethics intersects with what the WSP is enacting. Both the WSP and changes afoot at the Canadian Council on Animal Care (CCAC) raise issues of societal-level obligations to other animals when transitioning away from ethically objectionable uses of captive animals. Fenton will discuss the changes afoot at the CCAC on the national "governance" level concerning the scientific use of non-human animals. He will argue that further changes are required to bring Canadian entertainment and scientific industries in alignment with species inclusive ethics. We Canadians cannot ethically export away our legally recognized duties to captive non-human animals, including cetaceans. Neither can we "humanely kill" our way to meeting duties to non-human animals used science, education or entertainment.

Rebecca Ring will chair the session. Her research is on culture in non-human animals, with a focus on cetaceans. She argues that cultural practises and heritage imply meaning, value and agency for those enacting such practises. Achieving interspecies justice for cetaceans in captivity requires taking their cultural lives into account.

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