

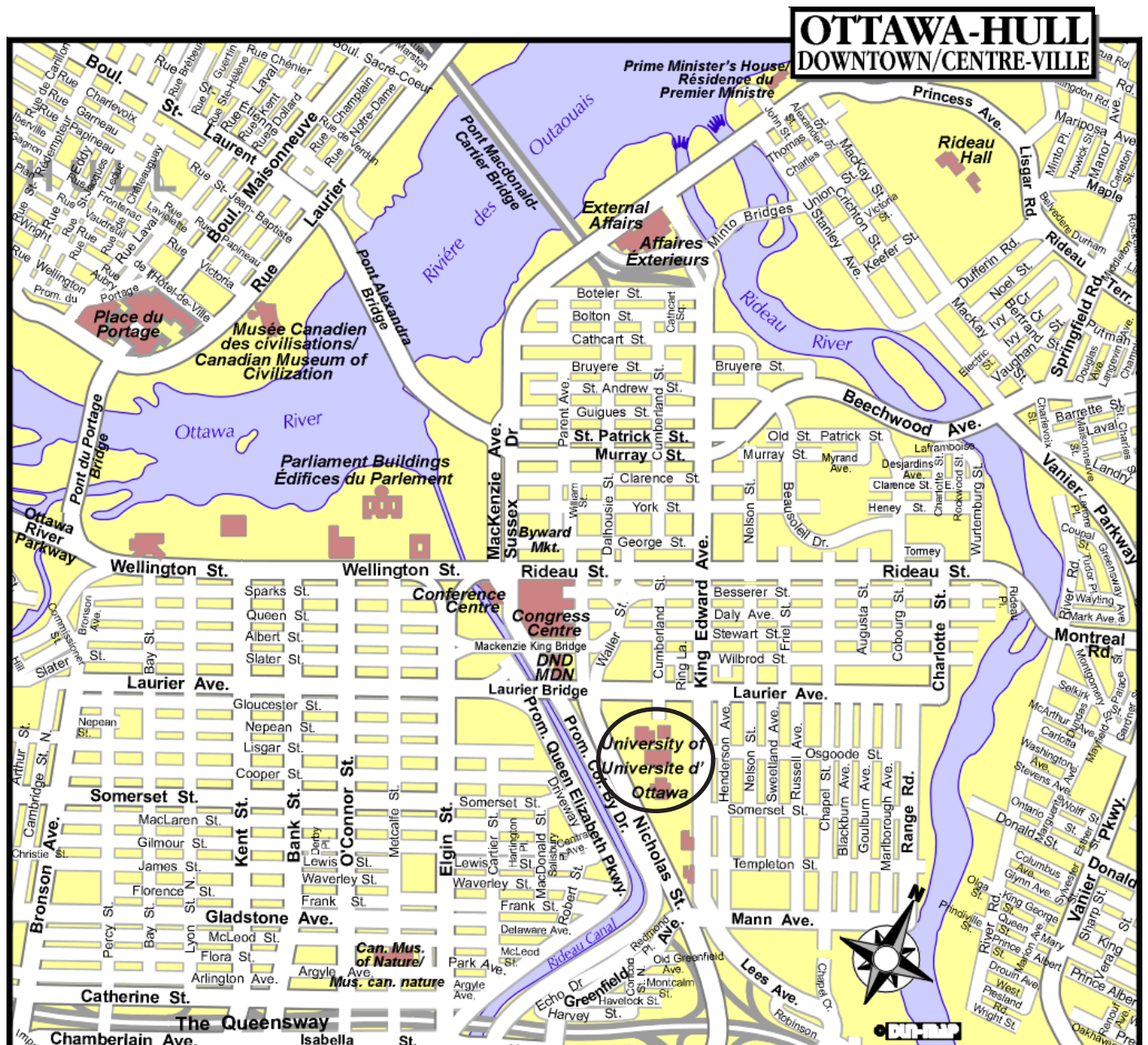
# Communiqué

SOCIÉTÉ CANADIENNE D'HISTOIRE ET DE PHILOSOPHIE DES SCIENCES

CANADIAN SOCIETY FOR THE HISTORY AND PHILOSOPHY OF SCIENCE

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Capital Ideas      Le capital des idées

## Communiqué

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Co-editors:

**Vincent Guillin**  
Philosophy Department  
Université du Québec à Montréal  
[guillin.vincent\\_philippe@uqam.ca](mailto:guillin.vincent_philippe@uqam.ca)

**Eleanor Louson**  
STS Graduate Program  
York University  
[elouson@yorku.ca](mailto:elouson@yorku.ca)

CSHPS-SCHPS Executive:

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## Editors' Message

CSHPS' annual meeting is finally upon us! We look forward to seeing you at our conference at the University of Ottawa, part of the Congress of the Social Sciences and Humanities. As long-time attendees, we encourage you to take advantage of everything the Congress has to offer, including the Big Thinking lectures, President's Reception, book fair, and beer tent.

We also hope that you will take part in our discussion about the future of this publication. *Communiqué* is our newsletter, and it's only effective if it meets the needs of our community. That's right, it's time for another lively debate about print vs. digital editions. Also, please think about how CSHPS might improve how you share and receive information about events and individual updates. We eagerly await your feedback at our AGM on June 1st.

*Eleanor and Vincent*

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## Abstracts

**Arnaud, Sarah** UQAM et Paris-Sorbonne

*Conscience ou accès? Vers un nouveau modèle de notre rapport aux émotions*

Les recherches scientifiques et philosophiques sur les états affectifs ont contribué à définir la nature des processus émotionnels. Je souhaite définir la façon dont le sujet accède à ces processus, soit à ses propres émotions. Il s'agira de distinguer à l'aide de la terminologie de Block sur la conscience, un accès phénoménal d'un accès cognitif. L'accès phénoménal désigne le « ce que cela fait, pour un sujet, d'avoir une expérience » (Block 2011, je souligne). Appliqué au domaine émotionnel, il correspond donc au contenu émotionnel, soit à la phénoménologie de l'émotion (le ce que cela fait), accompagné d'un ressenti subjectif (ce que cela fait pour un sujet). L'accès cognitif permet le traitement cognitif d'un processus ou d'une représentation, ici en l'occurrence, il permet le traitement cognitif de l'émotion. C'est une compréhension plus objective, en 3ème personne de ce qu'est l'émotion. Il peut être compris en termes de « conscience d'accès » selon les termes de Block, ou de ce que Rosenthal appelle « pensées d'ordre supérieur » (higher order thoughts) (Rosenthal 2002). J'indiquerai comment cette distinction permet de rendre compte des différentes manières dont le sujet se rapporte à ses états affectifs, contrairement à la notion de conscience. Session 12.

**Beaulac, Guillaume** Yale University

*The Role of Language and the Architecture of Cognition*

I focus on paradigmatic theories of the role of language in cognition used in cognitive science, both by philosophers and psychologists. Each of these views offers a different perspective on how language contributes to or changes cognition and, as such, these theories give rise to different interpretations of language's role. On some views, language is completely transformative while, on others, its role has much less impact on the mind's structure and organization. I analyze some of these frameworks and investigate their limitations. Using the analysis of these theories as a starting point, I develop a picture of the complex interaction between language and cognition that I deem more plausible by taking very seriously the idea that our mind is composed of many subsystems, and that language can interact and modify each one in different ways. I will then show there already exist examples in the literature suggesting we should not assign a single role to language. Moreover, I claim that the different roles posited by different theories each represent an aspect of the very complex interactions language—or to be more precise, parts of the faculty of language—will have with various cognitive processes. The resulting ap-

proach is a pluralistic perspective, according to which there are multiple roles for language in cognition, namely as a tool, as a means of internal communication and as a transforming, rewiring agent. Session 12.

**Benétreau-Dupin, Yann** University of Western Ontario

*Typicality Assumption and Observation Bias in Cosmology*

Philosophers and cosmologists have claimed that our self-locating uncertainty may help us deal with issues of fine-tuning and make predictions in the multiverse, and that it may guide cosmological model selection. By examining solutions given to the Sleeping Beauty problem, I claim that in cosmology where fundamental theories explaining the value of cosmological parameters are lacking, considerations about relative degrees of self-locating uncertainty won't help us find the physical laws of the universe. Furthermore, I show that even when the central goal of our inquiry is self-location, such considerations will not, by themselves, guide model selection. Session 5.

**Bolduc, Ghyslaine** Université de Montréal

*Method and history of science: Is rational reconstruction still relevant today?*

Following Imre Lakatos's attempts to renew Popper's Falsificationism, Mirko Grmek emphasized (1979) on a close collaboration between philosophy and the history of science. According to Grmek, historians of science should focus their work on the, "intellectual reconstruction of the past" in order to perform, "the study and the explanation of the genesis of scientific knowledge and its transforming structures". Today, some historians and philosophers think that the opposition between Internalism and Externalism is out-of-date and invalid. The question of whether a rational reconstruction of the history of scientific developments is vindicated or not, does not have a clear and definitive answer yet. However, giving up a rational reconstruction might mean that a certain rational order, which would make possible the progress of scientific knowledge, is poorly understandable or simply does not exist. This problem will be addressed through an overview of actual methodological tendencies, such as the rational reconstruction adapted to regional dimensions, the history of scientific representations and historical semantics. Session 7.

**Bolinska, Agnes** University of Toronto

*Model-Based Reasoning for Efficient Molecular Structure Determination*

I consider how the construction of molecular models may serve as a tool for gaining information about protein and DNA structure. In these cases, the determination of molecular structure was primarily informed by two sorts of evidence, which I refer to as data: x-ray diffraction pho-



tographs, produced when x-rays shone at a molecule are scattered and captured on a photographic plate, and stereochemical rules dictating permissible molecular configurations, given a molecule's atomic composition. Because x-rays are reflected but not subsequently refracted to produce a diffraction photograph, interpretation is required to determine structure from such photographs. Interpretation is also required to apply stereochemical rules to molecules. I characterize the process of determining molecular structure as one of eliminating structural candidates through the successive interpretation of pieces of data. I argue that data serve as constraining affordances for molecular structure: their interpretation warrants both the elimination of certain structural possibilities and the retention of others for further consideration. Interpretations of data vary with respect to how many structural candidates they eliminate. They also vary with respect to how certain scientists could be that only incorrect structures are eliminated upon interpretation. I argue that the strategy of considering stereochemical rules before x-ray diffraction photographs was more efficient than one in which this order is reversed because, on average, it maximizes the number of possibilities eliminated with each interpretation weighted according to the likelihood that those possibilities are correctly eliminated. Then, I show that the construction of molecular models further increased the efficiency of this strategy in two ways: by serving as a concrete means of prioritizing the stereochemical rules in scientists' reasoning and functioning as a cognitive aid, enabling scientists to consider many more such rules at once. Session 3.

**Brown, James Robert** University of Toronto  
*Mathematical Evidence: Pure vs Applied*

Philosophers distinguish pure from applied mathematics by saying that pure involves only mathematical concepts while applied uses a mixture of mathematical and non-mathematical notions. A trivial example: " $2+3=5$ " is pure; "2 applies + 3 apples = five apples" is applied. Mathematicians, by contrast, often cite examples loaded with physics and nevertheless call them pure. Why this difference? Philosophers are motivated by epistemology; they want to know if and how it is possible to justify claims that have no possibility of empirical content. Mathematicians draw their distinction based on whether the mathematics is interesting. Thus, General Relativity and Quantum Field Theory attract their attention for mathematical reasons. With this distinction in mind, we can ask whether philosophers are approaching the epistemic issues the right way? Can we learn mathematical facts by thinking about situations that involve non-mathematical entities? Let me make a second distinction between pure and applied ethics. (I'm running several existing distinctions together.) Typically, discussions about

abortion are instances of applied ethics; not surprisingly, they are about abortion. Discussions of the trolley problem, however, are not about runaway trollies, but rather about utilitarian principles; they are instances of pure ethics. The pure-applied ethics distinction is similar to the mathematicians' pure-applied distinction. Claim: The right model for philosophers concerned with the epistemology of mathematics should be ethics. Just as thought experiments, for example, can work in ethical reasoning, they can also work in mathematical practice. I will illustrate this claim with examples. A case is made to broaden the realm of legitimate evidence beyond standard proofs. Session 13.

**Bzovy, Justin** Western University  
*Aristotelian Species Pluralism*

Why has species pluralism only recently been considered a defensible position? (Kitcher, 1984; Mishler & Brandon, 1987; Dupre, 1993; Ereshefsky, 2001). Earlier debates about species concepts were framed monistically (Dobzhansky, 1935; Mayr, 1942; Simpson, 1951; Sokal, 1962). Participants assumed there was one true, optimal, or best species concept, and debated as to which one it was. All agreed that the true concept was not Aristotelian (e.g., Hull, 1965). For an Aristotelian, beavers (*C. canadensis*) do not evolve, they are members of a fixed 'type.' An underlying 'essence' explains why members of *C. canadensis* are similar. Any deviations from the fixed type are due to environmental factors, especially those that effect instances of reproduction and development. My work shows how such an 'Aristotelian' species concept was part of a larger 'rhetorical strategy.' The strategy is to show how a concept fit with evolutionary theory better than its competitors, because its competitors were closer to an 'Aristotelian' conception of species. Recent work has shown that the historical story, what some have called the essentialism story, that this rhetorical strategy was built upon is incorrect (McOuat, 2001; Winsor, 2003, 2006a), both respect to Aristotle's own theory of species (Henry, 2011), and with respect to other pre-Darwinian taxonomists (Winsor, 2006b). Despite the incorrectness of this back story, given a pluralist reading of Aristotle, I show how this rhetorical strategy can be developed and used outside of a monistic context. I will show how Aristotle's own species pluralism can be used as a philosophical foil with which one can measure and compare the current forms of species pluralism. Session 1.

**Chakravartty, Anjan** University of Notre Dame  
*Symmetry Principles and Dispositional Explanation*

In recent philosophy of science, the ontological nature of properties of scientific interest (as contested, for example, by neo-Humean and neo-Aristotelian approaches) has drawn significant attention. This paper focuses specifically on the

nature of properties associated with the “fundamental” constituents of matter described by the Standard Model of particle physics. While the mathematical formalism of the theory describes these properties (such as charge and spin) simply as invariants of certain symmetry group transformations (irreducible representations of the relevant groups), the status of symmetries as explanatory of the behaviors unified by the theory – electromagnetic and strong and weak nuclear interactions – is unclear. On the one hand, metaphysical minimalists are content with explanations to the effect that symmetries are an aspect of the structure of the world, and thus, laws governing the relevant phenomena are simply aspects of this structure. I characterize this form of explanation as “top-down”: accounting for the modal force of the theory in terms that proceed from the mathematical formalism to the natures of properties. On the other hand, those inclined towards more substantive explanations often describe these properties as dispositional, and the laws governing the associated phenomena as encoded in the properties in themselves. I characterize this form of explanation as “bottom-up”: accounting for the modal force of the theory in terms that proceed from the natures of properties to the mathematical formalism. I consider the question of whether these apparently highly disparate approaches are, in fact, notational variants. Session 9.

**Charbonneau, Mathieu** KLI Institute

*(Re)integrating modification processes to the origins of cumulative culture*

The cumulative open-endedness of human cultures represents a major break with the social traditions of nonhuman species. As traditions are altered and the modifications retained along the cultural lineage, human populations are capable of producing complex traits that no individual could have figured out on its own. For cultures to produce increasingly complex traditions, improvements and modifications must be kept for the next generations to build upon them, and high-fidelity transmission would thus act as a ratchet, retaining modifications and allowing the historical build-up of complex traditions. Mechanisms acting against slippage are important, of course, but cultures also need to move forward for anything important to be retained at all. In this paper, I argue that studies of modification-generating processes and the diverse ways they pattern cumulative culture have been overlooked. There are many ways that traditions can be modified and, depending on the structure of the cultural traits and of the design space explored by the population, different kinds of modification mechanisms will lead populations to exhibit different evolutionary patterns. The conclusion I reach is that even if a population is endowed with members capable of innovating and transmitting the improvements with high-fidelity, with the

wrong modification processes the structure of the design space will constrain the population to wallow in non-cumulative traditions. I illustrate my claims through the study of technical behaviours, such as tool use and tool manufacture, the very behaviours that are likely the markers of early cumulative culture in the human lineage. Session 1.

**Charenko, Melissa** University of Wisconsin-Madison

*The Scale of Change*

When deciding on the spatial or temporal scale for their work, many scientists choose the scale that allows them to answer questions relevant to their research. However, as scientists came together under large-scale, interdisciplinary projects in the 1980s, such as the Intergovernmental Panel on Climate Change (IPCC) or the International Geosphere-Biosphere Programme (IGBP), they had to work out a way to bring their disparate findings together in order to create a picture of global change. This was not a straight-forward process, and scientists from many fields began to explicitly call for more attention to scale around the same time. They wanted to know if the earth's processes were hierarchical; for example, if global vegetation changes could be discerned from simply scaling up the small-scale processes described in an ecological quadrat. Many worried, however, that new processes might emerge as the time or temporal scale increased, and that any decision about scale made certain processes visible while obscuring others. My talk examines these discussions about scale through the eyes of paleoecologists, who saw themselves in a position to bridge the gap between the geosciences and biological sciences because of their work studying vegetation across multiple scales. I suggest that historians of science need to be better attuned to questions of scale as they examine collaboration across scientific disciplines. Session 4.

**Cohen, Ed** University of Ottawa

*Dates of Easter*

In 325CE Constantine I (ca. 274-337; Flavius Valerius Aurelius Constantinus) gathered the Church Council in Nicæa to fix the date of Easter and set the date of the vernal equinox at March 21. Dionysius Exiguus (d. 556), who fixed the dating of the Christian era, also fixed the dating of Easter in the Julian calendar repetitively in 28 (Julian) x 19 (Meton cycle) = 532 years according to the Nicæan Creed. As the Julian calendar veered from the true spring, the date of the vernal equinox at about March 21 deviate from the beginning of spring. Pope Gregory XIII in 1582CE, with the help of mathematicians and astronomers, tried to fix that and succeeded fairly well by dropping three leap years in 400 years. That is why we call our present calendar after Pope Gregory. Carl Friederich Gauss (1777-1855) was a mathematical genius. He calculated the dates of Easter

among other mathematical and astronomical works. In his calculations he made a mistake, which he corrected shortly. After those deductions, many other ‘dates-of-Easter’ articles were published. One particular article, which I utilize in this paper, appeared in 1876 in *Nature* and is fairly simple, but is not necessary because of the Gaussian method. We calculated the dates from 2015CE to 2100CE using both the method of Gauss and the 1876 formula. This guarantees that the dates are probably correct. Session 4.

**Coleman, Neil** Bristol University

*Naming Neurons: The Classification Problem and its Philosophical Import*

From around the time of Cajal onwards, there has been great debate in neuroscience as to which properties of neurons ought to be used in establishing classes of neuronal types. Attempts to pin down a rigorous method of classification have involved a great array of properties, ranging from morphological considerations (which have historically taken centre stage), through to the more recent attempts involving genome expression. Nevertheless, the inherent complexity of neurons, the issue of biases alongside the difficulties regarding sample size and observational techniques have left this question intractably open. How, exactly, ought the neuroscientist to go about demarcating neuronal-type from type? Which property (or properties) should she treat as primary, and why? While it is clearly one of the core issues facing contemporary neuroscience (in a large part due to its relevance to systems analysis and functional neuroanatomy) it also has profound implications in the philosophy of neuroscience. In particular, it draws our attention to a pair of issues. The first concerns the status of neuronal types. On the one hand we must ask whether a polythetic or monistic approach should be favoured in classification. On the other we must ask whether these properties are essential or Aristotelean in some sense, or whether they are merely functionalist or pragmatist placeholders [4, 8]. Second, we can consider how the status of neuronal types affects the ongoing debates concerning explanation in neuroscience; it seems that the issues will have a significant bearing on Craver’s theory of mechanistic explanation. Session 6.

**Collier, John** University of KwaZulu-Natal, Durban

*Dynamical conditions for emergence and consequences*

‘Emergence’ is a term used in many contexts; it has become fashionable. Its usage in philosophy started in 1875 but the idea was expanded earlier by J.S. Mill and, later, C.D. Broad. I will be concerned with this form of emergence here. I distinguish it from uses like ‘computational emergence’, which can be reduced to combinations of program steps, or its application to merely surprising new features that appear in complex but reducible combinations of parts. I my

concept of interest is sometimes called “strong emergence”. This is ontological emergence that has the logical properties required by Mill and Broad (though there might be some quibbling about the details of their views). Logical properties, however, are hard to test physically, especially in the case of properties and systems that are strongly emergent. Therefore, I address dynamical systems that are embodied in processes. Everything that we can interact with through sensation or action is either dynamical or can be understood in dynamical terms, including dynamical emergence in the strong (nonreducible) sense. I will give general dynamical conditions that imply the logical conditions traditionally assigned to emergence in nature. The advantage of this is that, though we cannot test logical conditions directly, we can test dynamical conditions. This gives us an empirical and realistic form of emergence, contrary those who say it is a matter of perspective. I will briefly draw some consequences for study, control and management of strongly emergent systems. Session 9.

**Cope, Angela** York University

*Recalcitrant Carbon: Making the Plastisphere Matter*

The ways in which plastic is stabilized as a negative force in human and natural environments is as ubiquitous as it is a gross oversimplification of what plastic does in today’s world. In this case study, I examine how anti-plastic rhetoric is both mobilized and undercut in the work of Zettler et al on previously undescribed multi-species microbial communities, which occupy the plastic marine debris (PMD) found in high concentrations in the North Atlantic subtropical gyre. Dubbed “the Plastisphere,” the novel ecological habitat contains a diverse array of “heterotrophs, autotrophs, predators and symbionts” (Zettler et al, 7137), which, intriguingly, seem to be using the plastic not just as a raft but also as a food source. Using Barad’s theory of agential realism along with Bouchard’s work on termites, I argue that the persistent dualisms of organism/environment and nature/culture both break down with respect to the plastisphere, despite rhetorical practices to the contrary. Through the action of the extracellular polymeric substance (EPS) that provides both adhesion and digestion functions to the plastisphere, one can begin to see that the plastic, EPS and microbes are co-constitutive and cannot be addressed separately; instead an agential cut, enacting a “local resolution” (Barad, 2012) of the plastisphere is in order. Session 8.

**Derome, Léa** Université de Montréal

*Aristotle on Brain Functions and Intelligence*

It is a well-known fact that Aristotle underestimated the role of the brain in his account of movement, sensation, and mental operations, due to his cardiocentric theory and his poor knowledge of neuroanatomy. That underestima-

tion is in fact so substantial that it might be called his “most egregious scientific error” (Gross 1995). A great scientist in many respects, Aristotle would have made the worst neurologist. Yet when it comes to justifying the intellectual superiority of human beings in the animal kingdom, Aristotle recognizes the key contribution of the brain, in virtue of its cooling effect on the bodily heat produced by cardiac activity (Parts of Animals 648a, 650b, 653b). Human beings, who are supposed to possess the largest brains among the sanguineous animals (Parts of Animals 653a), owe their intelligence and their good temperament in part to an optimal thermal balance of hot and cold, resulting from that interaction between heart and brain. By challenging the traditional views on Aristotle’s brain theory, this paper aims to better appreciate the originality of the Aristotelian position within the history of ancient medicine. If the heart is ultimately the seat of psychic activities, the brain still has a significant part to play, together with the heart, in what we may call the “material conditions” for human cognition. Session 12.

**Determann, Jörg Matthias** Virginia Commonwealth University in Qatar

*Biology, Evolution and Scientific Islands of Efficiency in Arabia*  
Many scholars, including the authors of the United Nations Arab Human Development Report 2003, have considered rentier states as obstacles to science and innovation. Rents from oil and gas, they argue, enable the purchase of foreign expertise and create a mentality that discourages hard work and risk taking. How can we then explain the development of innovative research in the paradigmatic rentier states, the Arab Gulf countries? This development has taken the shape of Saudi Arabia’s King Abdullah University of Science and Technology, Qatar’s Education City and smaller research centers. This paper argues that oil wealth allowed for the parallel creation both of less efficient institutions and scientific islands of efficiency. While government ministries have supervised most universities in a bureaucratic fashion, individual princes have patronized and protected specific research centres that employed highly skilled and motivated experts. Under royal patronage and protection, scientists have been able to investigate sensitive areas with few financial and social constraints. This paper demonstrates the emergence of islands of efficiency within rentier science by focusing on the modern history of biology in the Gulf. Many religious scholars in the region have challenged the theory of evolution by arguing that it contradicts the Koran. As a result, ministries of education and universities have removed the theory from curricula and textbooks. However, princes protected certain research centers from the dual pressures of ideology and bureaucracy and allowed them to research evolutionary adaptations to the desert en-

vironment and discover fossilized primates and human ancestors. Session 12.

**Dumsday, Travis** Concordia University College of Alberta  
*Natural-Kind Essentialism, Platonism, and the Unity Problem*  
A longstanding question pertaining both to the metaphysics of natural kinds and to substance ontology has to do with the conjunction of the fundamental intrinsic properties of a thing (with ‘fundamental’ indicating properties not derived from other, more foundational properties of that thing), where those properties are inherently separable. How are such properties tied together? For example, the seemingly fundamental intrinsic properties of an electron include negative charge, half-integral spin, and a precise rest mass of  $9.109 \times 10^{-28}$  grams. Some of these clearly lack any necessary connection one to the other; this is apparent from the fact that other particles have the same negative charge as an electron but a different mass (tau leptons, for instance) while still others share the same mass as an electron but are positively charged (positrons). Property ties of this sort seem to demand an explanation, in a way that necessary property conjunctions do not (ex. the connection between the determinables ‘shape’ and ‘size’ is unproblematic). Oderberg (2007; 2011) calls this the ‘unity problem,’ and it is widely discussed both historically and in the recent literature. Taking my start from the primitive substance theory + natural-kind essentialism advocated by Ellis (2001) and Lowe (1989; 2006; 2012; 2013), among others, I argue that their ontology, if combined with Platonic realism about universals, produces a novel solution to the unity problem, one that carries certain unique advantages over and against existing solutions (including those presented by Ellis and Lowe). Session 9.

**Foley, Robert** University of Western Ontario  
*Flexible Interaction as a Criterion for Consciousness*

The two standard methods of attributing consciousness of an object (henceforth consciousness) to a subject in psychophysical studies are reportability and above chance performance in forced choice discrimination tasks. Behavioural criteria, such as the latter, have largely been rejected, in part, due to evidence that unconscious perceptual processing can have an effect on subjects’ behaviour. Instead reportability criteria have become the ‘gold standard’ for the attribution of consciousness to a subject. Despite this reliance on reportability in psychophysics, it is questionable whether reportability is a reliable indicator of either consciousness or the lack thereof. Some philosophical accounts have attempted to address this issue by arguing for a close link between intentional access to information and consciousness. However, when such accounts are applied to the empirical literature, they tend to collapse into either standard behav-



ioural or standard reportability criteria. In line with such intentional accounts, I propose a criterion for the attribution of consciousness to a subject that relies on a subject's capacity to use information flexibly (FI). I argue that FI holds at least as much intuitive force as reportability. In addition, it is compatible with the empirical evidence that undermines standard behavioural criteria. Finally, FI is operationalizable and is dissociable from both reportability and standard behavioural criteria. As such, FI offers an empirically and philosophically adequate means of investigating consciousness that has not yet been pursued. Session 6.

**Fraser, Doreen** Waterloo University and

**Koberinski, Adam** University of Western Ontario

*The Higgs mechanism and superconductivity: Physical or formal analogies?*

When the discovery of the Higgs boson was announced with great fanfare in 2012, physicists were once again called upon to explain what the Higgs boson is. This paper critically examines the prospects for philosophers to adopt these explanations as a basis for the physical interpretation of the Higgs mechanism. The proffered explanations relied on analogies with condensed matter systems. Explanations of this type can be traced all the way back to the introduction of the concept of spontaneous symmetry breaking in particle physics, which was inspired by analogies with the BCS model of superconductivity. It was later recognized that the phenomenological Ginsburg-Landau (GL) model of superconductivity is a closer analogue to the Higgs model than the dynamical BCS model, which spurred the development of 'dynamical' models to underpin the Higgs model. We apply a modified version of Hesse's account of analogies in science to analyze the types of analogies invoked between the Higgs model and the BCS and GL models of superconductivity. We conclude that the analogies between the Higgs model and models of superconductivity are purely formal. Physical disanalogies and material disanalogies (i.e., mismatches between mappings of causal structure) entail that analogies to models of superconductivity are not a useful basis for the physical interpretation of the Higgs mechanism. Furthermore, we recommend that the GL model (rather than the BCS model) be used as the analogue to the Higgs model for pedagogical purposes. Finally, the nature of the analogies to the GL and BCS models carries implications for current debates about the status of the Higgs mechanism in the philosophy of physics literature. Session 9.

**Geampana, Alina** McGill University

*An analysis of scientific risk models for contraceptive pills*

The main purpose of this paper is to analyze scientific risk models used historically in managing debates surrounding the safety of oral contraceptives. I specifically look at

the ways in which risk evaluations have been employed by scientists, clinicians, drug regulation bodies, and medical associations. Firstly, the study stresses that through entering the domain of birth control in the 1960s, hormones became entangled with politics. Not only was intervention on the female body facilitated, but significant health concerns were minimized throughout the clinical trial process and even after the technology became available to consumers. Many women were not aware of the risks of using the contraceptive at the time. The 1950s clinical trials that took place in Puerto Rico were a direct consequence of a widely held belief that the fertility of this impoverished and highly populated region should be controlled. It is during these trials that the health risks and side effects of hormonal contraceptives became evident, although not considered alarming enough by scientists and clinicians. Risk models thus became entangled with population control ideologies. Historically, unplanned pregnancy and abortion have been considered a less desirable alternative than exposing oneself to the potential health risks and side effects caused by the hormonal compounds used in contraceptive pills. I will argue that these historical trends still have repercussions for the way in which scientific risk models for hormonal contraceptives are employed today. This study emphasizes the social context in which scientists have constructed the notion of acceptable medical risk. Session 8.

**Grier, Jason** York University

*The Social Construction of a Centre of Calculation: The Royal Observatory Under John Flamsteed*

In his observation diary for February and March, 1698, the Astronomer Royal John Flamsteed noted visits to the Royal Observatory in Greenwich by the Russian Czar Peter I, better known as Peter the Great. Peter I was in England as part of his European tour, the official purpose of which was to learn the art of ship-building. This royal visit might be regarded as the high point of Flamsteed's scientific authority. In the course of the next decade he found himself mired in a battle with Isaac Newton over publication of his observations. In 1710, Queen Anne issued a warrant appointing visitors from the Royal Society to the Observatory. Two years later, Newton and Edmond Halley published the infamous "pirated" version of Flamsteed's star catalogue. Flamsteed had lost his ability to control the data that he had laboured at Greenwich for thirty years to produce. Much of his career had been devoted to building and protecting his status as one of the principle astronomers in Europe and it is important to recognize this labour when evaluating his career. Thus, in this paper I consider Flamsteed's social, literary and material technology in his efforts at asserting his authority and will trace his struggle to establish the Royal Observatory as a "centre of calculation." Session 4.



**Guillin, Vincent** Université du Québec à Montréal  
*Structure normative de la science et régulation morale des savants : Analyse sociologique et polémique institutionnelle chez Auguste Comte*

Comte, fondateur de la sociologie, ne pouvait faire l'économie d'une sociologie des sciences, et donc d'une sociologie des savants : si la réorganisation temporelle d'un monde occidental en crise passait par l'élaboration d'une nouvelle doctrine sociale, et si cette nouvelle doctrine sociale devait être produite conformément aux exigences de l'esprit positif, alors cet esprit positif ne pouvait se mieux saisir que par l'étude des réalisations de la classe en laquelle il s'incarnait, à savoir la classe savante. Cette ambition politique pour la science et ce rôle crucial attribué aux savants expliquent en grande partie la déception de Comte et la virulence de ses attaques quand ses espoirs de reconnaissance académique (à l'École polytechnique et à l'Académie des sciences) ont été déçus les uns après les autres. Dans notre présentation, nous aimerions montrer la manière dont les portraits que Comte dresse de lui-même et des savants qui lui sont contemporains, bien loin que d'être les manifestations déplacées d'un orgueil froissé, fonctionnent comme autant d'illustrations ou de corroborations des différentes thèses développées par la sociologie comtienne (qui, par certains aspects, préfigurent certaines thèses mertonniennes) relativement à la nature et au fonctionnement de la communauté scientifique, autant dans son état présent et imparfait que dans son état final et positif. On verra ainsi que chez Comte analyse sociologique et polémique institutionnelle sont étroitement solidaires. Session 11.

**Helmes-Hayes, Rick** University Waterloo  
*Piety and Politics: Abraham Lincoln McCrimmon, Pioneer of Applied Christian Sociology at McMaster University, 1906-1935*

Extant accounts of the early history of Canadian English-language sociology focus almost exclusively on developments at McGill University where Carl Dawson established what is regarded as the first department of sociology in the early 1920s. However, there were at least seventeen men who taught sociology at seven of Canada's universities and four of Canada's colleges between 1895-6 and 1919-20; i.e. well before Dawson was appointed at McGill. These men, most of whom were Protestant clergymen who taught so-called "social gospel" sociology, are the true pioneers of Canadian sociology. Notable among them is Abraham Lincoln McCrimmon (1865-1935), the first person appointed to a designated chair in sociology in Canada (McMaster University, 1906). The paper discusses the nature of the social gospel, describes the nature and role of sociology within the social gospel, documents the growth of the department at McMaster (1906-35), and outlines McCrimmon's personal

sociological orientation. The analysis demonstrates that while the sociology taught in most Canadian colleges and universities during the period 1890-1930 was inspired and sustained by Christian theological and moral beliefs rooted in the social gospel, and had a 'do-gooding' intent, it was more scientific in character than has been heretofore appreciated. Rather than constituting part of an unscientific "pre-history" of the discipline, it was a type of applied sociology rooted equally in science and religion that constituted an early form of what Michael Burawoy has referred to as "public sociology". Session 11.

**Hunter, Michael A.** University of California  
*Philosophers Behaving Badly: The systemic failures of "Experimental Philosophy"*

The movement known as "Experimental Philosophy" - which is just over a decade old - attempts to answer questions about "how human beings actually happen to be." To do so, proponents of experimental philosophy attempt to answer these questions by borrowing tools from cognitive science and social psychology to investigate the "psychological processes underlying people's intuitions about central philosophical issues." While the experimental philosophy movement once seemed promising, the reality over the last decade has illustrated otherwise. The movement has been plagued with questions about methodology and whether the results generated by experimental studies are philosophically significant. While there is much debate about these concerns, there has been a substantial and important critique that has been missing from the entire debate. This paper will argue that the experimental philosophy movement has an issue that greatly undermines and hinders the success of the movement: the systemic exclusion of marginalized people (and their communities), especially so from the standpoint of the participants in the experiments. Experimental philosophers have not taken seriously enough the notion that their methodology and survey parameters have ignored particular groups of individuals in ways that are harmful to the communities of people whom they have ignored. This paper uses both qualitative and quantitative data from the past ten years of experimental philosophy publications to bring to light the widespread issue that the movement faces. In conclusion, this paper offers a number of solutions to positively change the experimental philosophy movement. The benefits of addressing the systemic issues in the experimental philosophy movement are the following: more inclusiveness in the discipline, more robust results from experiments, and the potential to introduce different research projects that appeal to under-represented groups. The suggested changes to the movement will have a positive reverberating effect on both the discipline at large and upon what we can know about groups that have been |

for the vast majority of history in analytic philosophy - implicitly or overtly ignored. Session 10.

**King, Martin** University of Guelph

*Is Causation the Only Way to Solve the Asymmetry Problem?*

In this essay, I look at the problem of symmetry in explanation and explore the prospects of non-causal asymmetry. Hempel and Oppenheim proposed a deductivist account of explanation (D-N) whose structure it was shown could be exploited to run explanations in reverse of how one would expect an explanation to go. This is to say that one can find deductive derivations that satisfy the D-N account, but are contrary to our intuitions about explanation, such as explaining the height of a flagpole by the length of its shadow and the relevant laws of electromagnetism. Causal accounts of explanation have been favoured in part because cause exhibits a natural asymmetry, however I will argue that hope is not lost for a non-causal notion of explanatory asymmetry. After outlining the problem, I then explore various possible strategies for exhibiting explanatory asymmetry in model-based explanations, including comparisons of explanatory depth and restrictions on permissible models, whether causal, temporal, unificationist, or theoretical. I argue that explanatory symmetry may be avoidable, but in some cases debarring the counterintuitive cases may require pragmatic considerations concerning the explanandum, or ad hoc modifications. I further contend that symmetry is not a fatal problem for an account of explanation. Many of the models and equations of fundamental physics exhibit symmetry, and many symmetrical explanations are entirely unproblematic. I hope to show that explanatory asymmetry is not identical with causal asymmetry. Session 9.

**Koberinski, Adam** see **Fraser** for abstract on page 8.

*The Higgs mechanism and superconductivity: Physical or formal analogies?*

**Leder, Garson** University of British Columbia

*Cognition, Emotion, and Causes: Questioning the Theoretical Foundations of CBT*

Since the latter half of the 20th century, cognitive behavioral therapy (CBT) has become the dominant form of psychotherapy in North America and the U.K. While it is clearly an effective treatment for many forms of psychological problems, CBT is based on questionable metaphysical assumptions about both the nature of cognitions and emotions and the role of cognitions in psychopathology. CBT, as opposed to behaviorism, psychodynamic psychotherapies, and emotion-based therapies, is unique in calling for a reconceptualization of maladaptive psychological states such as depression and anxiety as 'cognitive disorders' rather than affective disorders. However, cognitive theory is explicit in

denying that it is making a causal claim about the etiology of the 'affective disorders'; cognitions are supposed to play a 'primary', though non-causal, role in the development and treatment of depression, anxiety, and other maladaptive affective states. In contrast, the CBT model is based on a causal appraisal theory of the emotions; emotions are claimed to be caused by cognitive appraisals or judgments. The cognitive model, then, maintains that while cognitions may not cause affective disorders, they cause affect. This paper argues that there are serious theoretical and empirical problems in reconciling these two claims as well as problems with CBT's distinction between emotional and cognitive processes. A more plausible cognitive-cause model of the affective disorders is offered, while remaining agnostic about cognitive appraisal theories of affect. Session 12.

**Life, Jonathan** University of Western Ontario

*On Norms and Communication in Linguistic Science*

This paper is part of a larger project defending a Chomskyan bio-psychological foundation for linguistics against the Platonist alternative proposed by Jerrold Katz and other philosophers. The paper is concerned with objections to the bio-psychological foundation for linguistics stemming from concerns relating to linguistic norms and communication. The work of William Labov and other sociolinguists is used to demonstrate the dangerous consequences of common-sense prescriptivism about natural language. For example, in the phonologies of some African American varieties of English, the vowel sounds in {pin, pen}, {sheaf, sheath} and {clothe, clove} are not differentiated. This oversight led to the misdiagnosis of many African American children in the 60s and 70s as hearing impaired. David Foster Wallace's work on English usage is used to show that common-sense prescriptivism is not the only possible understanding of natural linguistic norms. By understanding linguistic prescription as justified by utility rather than fact, a version of prescriptive grammar can be shown consistent with both racial equality and a bio-psychological foundation for linguistics. Lastly, Ray Jackendoff's work on internalist semantics is used to propose a solution to a paradox of communication. In Jackendoff's semantic system a kind term is understood as a cognitive structure that has descriptive features but lacks any indexical feature. This analysis is used to flesh out an understanding of human communication consistent with a bio-psychological foundation for linguistics. Session 12.

**Louson, Eleanor** York University

*Documentary Filmmakers' Collaboration with Science Consultants*

David Kirby's *Lab Coats in Hollywood* (2011) examined the understudied role of science consultants in blockbuster

film production. Kirby argued that successful relationships between filmmakers and science consultants occur when scientists' contributions are in service to the film's story. I argue that this also applies within the context of wildlife and environmental documentary films; specifically, that filmmakers carefully manage their collaborative relationships with biologists and environmental scientists in order to enhance their films' storytelling. When successful, the cooperative relationships between biologists and wildlife documentarians result in mutual benefits, including better footage of animal behaviour for filmmakers and greater research publicity for scientists. The filmmaker-science consultant relationship faces tension if scientists' commitment to accuracy undermines filmmakers' effective storytelling. Session 8.

**Lusk, Greg S.** University of Toronto  
*How to Reason from Data to Phenomena*

Which patterns of reasoning allow scientists to infer the existence of phenomena from data? Famously, Bogen and Woodward (1988 and Woodward 1989, 2000, 2011) have argued that (typically) phenomena are inferred from data in a bottom up fashion. They claim, based on an examination of empirical cases, that theoretically deriving and explaining data is near impossible, and even if it were possible, there would be no rationale for doing so. Counter to this claim, I argue that computational advancements have provided such a rationale. I examine the case of Fourier Transfer Infrared Spectroscopy (FTIR) as it is used to measure trace gas concentrations in the atmosphere. Scientists face a problem in using FTIR to quantify trace gases: there are multiple trace gas concentrations that are consistent with the data available from the spectrometer. To overcome this problem, scientists employ a "retrieval" process in which they simulate the data that would be observed given possible distributions of trace gases, and then infer that the concentrations which produced the best simulated data are in fact the actual concentrations. I claim that the retrieval process aims to establish explanations of data, and in doing so, relies on derivations of an epistemically important sort. I conclude that there is in fact a rationale for explanations of data and that the patterns of reasoning from data to phenomena are more diverse than previously thought. Session 3.

**Malaterre, Christophe** Université du Québec à Montréal  
*Is "being alive" a bivalent property?*

We have an intuitive understanding of whether something is alive. This intuitive understanding comes with the view that being alive is a bivalent property: this ant is alive, that rock isn't. However, fleshing out the details of what it takes for something to scientifically qualify as alive or not is far from trivial. Dozens of definitions of life have even been

proposed (Pályi, Zucchi, and Caglioti 2002; Popa 2004). Yet all seem prone to counterexamples. For Cleland and Chyba (2002), the problem is epistemic and stems from the current unavailability of a theory of life. For Machery (2011), the problem originates from the organization of science, with different disciplines focusing on different life-related phenomena. One can object though that it is just a matter of time for these epistemic and organizational issues to be solved. A stronger argument would consist in empirically undermining the very thesis that being alive defines a natural kind in a clear bivalent way. Following this argumentative line, several have proposed to construe life as coming in "degrees" (Bruylants, Bartik, and Reisse 2010; Bedau 2011). While rocks end up being characterized as definitely non-living and ants as definitely living, nature is construed as populating an in-between grey-zone with different more-or-less alive entities: self-replicating RNAs, self-repairing crystals, cross-catalytic chemical networks, giant viruses, mini bacteria etc. After reviewing the controversies about defining life, I endorse the view that life comes in degrees. I further argue that current scientific evidence provides good empirical reasons to construe the grey-zone between non-living matter and living matter as being populated by systems that are more-or-less alive in virtue of performing more-or-less satisfactorily along several life-critical "modes", and that have different types of "liveness signatures". Session 1.

**Manafu, Alex** University of Paris  
*For a Functional Understanding of Piezoelectricity*

This paper argues that piezoelectricity is not only a striking example of broken symmetry as it manifests itself in condensed matter systems, but also of multiple realizability, since it is implemented by different mechanisms in different materials: ionic displacement in crystals (Tichy et al. 2010), dipole rotation in polymers (Anderson and Eriksson 1970, Gross and Williams 1982, Otter et al. 1985), streaming potential associated with the electric double layer in interface materials like cement or bone (Lewis et al. 1992, Lewis 1994, Fukada 1995, 2000, Sun et al. 2004). This has important consequences with regard to the controversy amongst practicing scientists on how to best understand this phenomenon (Black & Korostoff 1974, Gross & Williams 1982), which has not yet been resolved, and which so far has gone unnoticed by philosophers of science. The paper argues that piezoelectricity should be understood as a functional, rather than a microstructural property of materials. Session 9.

**Michaud, Janet** University of Waterloo and  
**Turri, John** University of Waterloo  
*Three Factors that Affect the Credibility of Scientific Research*



Understanding science requires appreciating the values it presupposes and its social context (Douglas 2009). Both the values that scientists hold and their social context can affect scientific communication. Philosophers of science have recently begun studying scientific communication, especially as it relates to public policy (Whyte and Crease 2010; Homer-Dixon, Douglas and Edwards 2014). Some have proposed “guiding principles for communicating scientific findings” to promote trust and objectivity (Elliott and Resnick 2014). This paper contributes to this line of research in a novel way using experimental philosophy. We report results from three experiments testing judgments about the trustworthiness, competence and objectivity of scientists. More specifically, we tested whether such judgments are affected by three factors: consulting or not consulting non-scientists, conducting research under a restrictive or non-restrictive governmental communication policy, and the source of a lab’s funding (i.e., government funding, private funding, or a combination of the two). We found that each of these factors affects ordinary judgments of trustworthiness, competence and objectivity. These findings support several recommendations to improve scientific communication and communication policies. Session 10.

**Mitchell, Benjamin David** York University  
*Experiments in Freedom: Claude Bernard, Friedrich Nietzsche, and the Education of Experience*

What did the teacher, the priest, the artist, and the physician all have in common for Nietzsche, and why did he consider their fusion to be the future of education? The answer to this is that they were all manifestations of different facets of dynamic self-regulation; the emulation of which would allow students to become free to shape themselves, as well as the world around them. Nietzsche was very engaged in the debates around animal experimentation in the late nineteenth century, and there is abundant circumstantial evidence to show that this likely brought him into contact with the thought of the French physiologist Claude Bernard. Bernard’s writings about the milieu intérieur created a parallel between how more perfect and complicated organisms became freer in their larger cosmic environment, and how experimentation permitted humans to become freer than any other animal. This form of increasing freedom also mirrored educational debates about the role and importance of “independence”. While Nietzsche initially criticized independence as the goal of education while working as Wagner’s propagandists, he increasingly began to defend it as one of the highest educational ideals. More than this, he appears to have taken on board Bernard’s understanding of the relationship between experimentation, dynamic self-regulation, and freedom more broadly, later applying it to his philosophers of the future who become free in a process

remarkably similar to that achieved by the milieu intérieurs of complex organisms. Session 11.

**Mordvinov, Dmitry** University of British Columbia  
*From Breeds to Nations: The Problem of Race in the Russian Empire*

While the problem of race in the Russian Empire has not been given adequate attention, Russia cannot be seen as an exception to this pan-European phenomenon of racial thinking. The paper addresses the rise of racial thinking and racial science in the late Russian Empire and questions this rise engendered. The paper argues that the notions became heavily entangled, with such concepts as “tribes,” “breeds,” “ethnicities” and others also added to the mix. The paper analyses the question of the inorodtsy, a category denoting non-Slavic subjects of the Russian Empire, and argues that the inorodtsy were often understood in racial terms, as anthropology and ethnography were called upon to study the “indigenous races” of the Russian Empire. The paper affirms that seeing the category of inorodtsy as a distinctively Russian imperial way to think about race adds to our understanding of both the Russian imperial state, and pan-European scientific processes it was involved in. The paper seeks to demonstrate that race was not a foreign concept for Russian science and popular culture. By 1905 and especially in the decade that followed, the Russian scientifically-minded public engaged in a full-fledged debate about races, their inherent traits and comparative value in a manner highly similar to Western Europe. While not suggesting that there were no differences between the Russian Empire and its Western counterparts in the ways the idea of race had played out, the paper stresses the necessity to view Russian developments as a part of a pan-European scientific and cultural movement. Session 2.

**Okruhlik, Kathleen** University of Western Ontario  
*Philipp Frank and Thomas Kuhn*

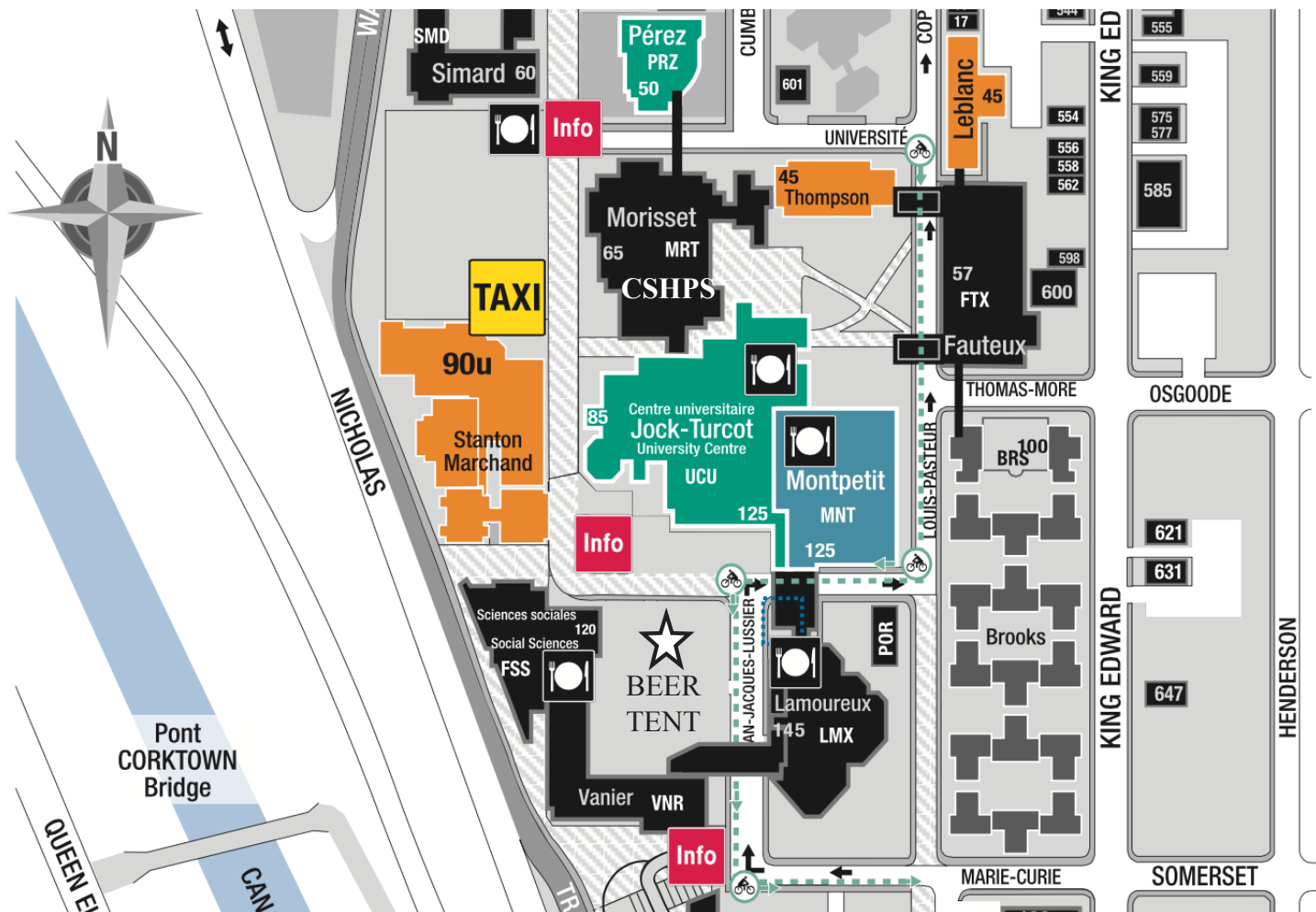
Robert Butts related an anecdote told by Adolf Grünbaum concerning a 1954 lecture by Philipp Frank for the American Academy of Arts and Sciences in Boston. Grünbaum was sitting next to Thomas Kuhn in the audience. And as Grünbaum tells the story, Philipp Frank provided that day a rather striking account of what later came to be known “Kuhn loss.” There is no official record of this story, but I have written to Professor Grünbaum and he stands by his account. The anecdote will serve as a jumping-off point for a comparison of Frank and Kuhn on a variety of issues. This may seem a poorly motivated undertaking, since Kuhn was perhaps the most famous philosopher of science of the twentieth century while Frank is largely forgotten. Furthermore Kuhn’s *Structure* is supposed to have displaced the logical empiricism of which Frank was a representative.

# CSHPS Programme Day 1: Saturday, May 30th

8h45-10h45	<p>1: Philosophy of Biology Morisset 205</p> <p><b>Justin Bzovy</b>, Western University <i>Aristotelian Species Pluralism</i></p> <p><b>Mathieu Charbonneau</b>, KLI Institute <i>(Re)integrating modification processes to the origins of cumulative culture</i></p> <p><b>Christophe Malaterre</b>, Université du Québec à Montréal <i>Is “being alive” a bivalent property?</i></p> <p><b>Yussif Yakubu</b>, McMaster University <i>A Profile of Contemporary Darwinian Explanation</i></p> <p>Chair: Mitia Rioux-Beaulne, University of Ottawa</p>	<p>2: Scientific Authority Morisset 218</p> <p><b>Jörg Matthias Determann</b>, Virginia Commonwealth University in Qatar <i>Biology, Evolution and Scientific Islands of Efficiency in Arabia</i></p> <p><b>Dmitry Mordvinov</b>, University of British Columbia <i>From Breeds to Nations: The Problem of Race in the Russian Empire</i></p> <p><b>David Orenstein</b>, University of Toronto <i>The June 1938 AAAS Salmon Symposium in Ottawa: Its Genesis, The Event and Its Influence</i></p> <p><b>Callum C.J. Sutherland</b>, York University <i>Dashed Hopes: The Fraser River Fisheries Collapse of 2009</i></p> <p>Chair: Debra Lindsay, University of New Brunswick</p>
10h45-11h00	Coffee Break in Morisset 218	
11h00-12h30	<p>3: Reasoning about Evidence Morisset 205</p> <p><b>Agnes Bolinska</b>, University of Toronto <i>Model-Based Reasoning for Efficient Molecular Structure Determination</i></p> <p><b>Greg S. Lusk</b>, University of Toronto <i>How to Reason from Data to Phenomena</i></p> <p><b>Isaac Record</b>, University of Toronto (session organizer) <i>How simulations become evidence</i></p> <p>Chair: Isaac Record, University of Toronto</p>	<p>4: Calculating Change Morisset 218</p> <p><b>Melissa Charenko</b>, University of Wisconsin-Madison <i>The Scale of Change</i></p> <p><b>Ed Cohen</b>, University of Ottawa <i>Dates of Easter</i></p> <p><b>Jason Grier</b>, York University <i>The Social Construction of a Centre of Calculation: The Royal Observatory Under John Flamsteed</i></p> <p>Chair: Kathleen Okruhlik, University of Western Ontario</p>
12h30-13h30	<p>Big Thinking Lecture: Murray Sinclair <i>What do we do about the legacy of Indian residential schools?</i> Jock-Turcot University Centre, Alumni Auditorium</p>	
13h30-15h00	<p>5: Philosophy of Physics Morisset 205</p> <p><b>Yann Benétreau-Dupin</b>, University of Western Ontario <i>Typicality Assumption and Observation Bias in Cosmology</i></p> <p><b>Kent Peacock</b>, University of Lethbridge <i>“Where Are They?” Fermi, Lotka, and the Long Odds of Survival in a Dangerous Universe</i></p> <p><b>Ryan Samaroo</b>, University of Bristol <i>The Principle of Equivalence is a Criterion of Identity</i></p> <p><b>Corey Sawkins</b>, University of Guelph <i>The Explanatory Role of Spacetime in Physics</i></p> <p>Chair: Doreen Fraser, Waterloo University</p>	<p>6: Neuroscience Morisset 218</p> <p><b>Neil Coleman</b>, Bristol University <i>Naming Neurons: The Classification Problem and its Philosophical Import</i></p> <p><b>Robert Foley</b>, University of Western Ontario <i>Flexible Interaction as a Criterion for Consciousness</i></p> <p><b>Jessey Wright</b>, University of Western Ontario <i>Data Analysis and the Evidential Scope of Neuroimaging Results</i></p> <p>Chair: Christophe Malaterre, Université du Québec à Montréal</p>
15h00-15h15	Coffee Break in Morisset 218	

# CSHPS Programme Day 1: Saturday, May 30th (cont'd)

15h15-17h15	<p>7: Empiricism Morisset 205</p> <p><b>Ghyslain Bolduc</b>, Université de Montréal <i>Method and history of science: Is rational reconstruction still relevant today?</i></p> <p><b>Kathleen Okruhlik</b>, University of Western Ontario <i>Philipp Frank and Thomas Kuhn</i></p> <p><b>Nicholas Ray</b>, University of Waterloo <i>Scientific Empiricism and the Given</i></p> <p><b>Jean-Jacques Rousseau</b>, University of Toronto <i>Is Newton to Einstein What Vinyl Is to MP3s: The Problem of Backward Compatibility in Science</i></p> <p>Chair: Anjan Chakravartty, University of Notre Dame</p>	<p>8: Innovation, Collaboration, &amp; Research Morisset 218</p> <p><b>Alina Geampana</b>, McGill University <i>An analysis of scientific risk models for contraceptive pills</i></p> <p><b>Eleanor Louson</b>, York University <i>Documentary Filmmakers' Collaboration with Science Consultants</i></p> <p><b>Erich Weidenhammer</b>, University of Toronto <i>Recreating August Kirschmann's "Colour Mixing Apparatus": An Exercise in the Tactile History of Science.</i></p> <p><b>Angela Cope</b>, York University <i>Recalcitrant Carbon: Making the Plastisphere Matter</i></p> <p>Chair: David Orenstein, University of Toronto</p>
17h15-17h30	Coffee Break in Morisset 218	
17h30-19h00	<p>International Speaker: Janet Browne Aramont Professor of the History of Science, Harvard University <i>The natural economy of households: Charles Darwin and the ledgers of life</i> Morisset 218</p>	



Please see the back page for a complete campus map.



# CSHPS Programme Day 2: Sunday, May 31st

8h45-10h45	<p style="text-align: center;"><b>9. Analogy, Explanation, &amp; Symmetry</b> Morisset 218</p> <p><b>Anjan Chakravartty</b>, University of Notre Dame <i>Symmetry Principles and Dispositional Explanation</i></p> <p><b>John Collier</b>, University of KwaZulu-Natal, Durban <i>Dynamical conditions for emergence and consequences</i></p> <p><b>Travis Dumsday</b> Concordia University College of Alberta <i>Natural-Kind Essentialism, Platonism, and the Unity Problem</i></p> <p><b>Doreen Fraser and Adam Koberinski</b>, Waterloo/UWO <i>The Higgs mechanism and superconductivity: Physical or formal analogies?</i></p> <p>Chair: Travis Dumsday, Concordia University College of Alberta</p>		<p style="text-align: center;"><b>10. Values in Science</b> Morisset 205</p> <p><b>Michael A. Hunter</b>, University of California <i>Philosophers Behaving Badly: The systemic failures of "Experimental Philosophy"</i></p> <p><b>Janet Michaud and John Turri</b> University of Waterloo <i>Three Factors that Affect the Credibility of Scientific Research</i></p> <p><b>Esther Rosario</b>, University of Alberta <i>Evolutionary Explanations of Female Sexuality: Combining Feminist Values and New Empirical Perspectives</i></p> <p><b>Matt Silk</b>, University of Waterloo <i>John Dewey on Values in Science</i></p> <p>Chair: Gordon McOuat King's/Dalhousie University</p>
10h45-11h00	Coffee Break in Morisset 218		
11h00-12h30	<p style="text-align: center;"><b>9. Analogy, Explanation, &amp; Symmetry (cont'd)</b> Morisset 218</p> <p><b>Martin King</b>, University of Guelph <i>Is Causation the Only Way to Solve the Asymmetry Problem?</i></p> <p><b>Alex Manafu</b>, University of Paris <i>For a Functional Understanding of Piezoelectricity</i></p>	<p style="text-align: center;"><b>Conférence Paterson/ Paterson Lecture (Canadian Society for the History of Medicine)</b> Social Sciences FSS 1007</p> <p><b>Natalie Zemon Davis</b>, University of Toronto <i>Physicians, Healers and their Remedies in Colonial Suriname</i></p>	<p style="text-align: center;"><b>11. Doing Sociology</b> Morisset 205</p> <p><b>Vincent Guillin</b>, Université du Québec à Montréal <i>Structure normative de la science et régulation morale des savants : Analyse sociologique et polémique institutionnelle chez Auguste Comte</i></p> <p><b>Rick Helmes-Hayes</b>, Waterloo <i>Piety and Politics: Abraham Lincoln McCrimmon, Pioneer of Applied Christian Sociology at McMaster University, 1906-1935</i></p> <p><b>Benjamin David Mitchell</b>, York <i>Experiments in Freedom: Claude Bernard, Friedrich Nietzsche, and the Education of Experience</i></p> <p>Chair: Mathieu Charbonneau, KLI</p>
12h30-13h30	<p><b>Big Thinking Lecture: Joseph Yvon Theriault</b> <i>Que reste-t-il du Canada français? (Whither francophone cultures in America?)</i> Sciences sociales FSS 4007</p>		
13h30-15h30	CSHPS Annual General Meeting in Morisset 218		
15h30-15h45	Coffee Break in Morisset 218		
15h45-17h45	<p><b>Drake Lecture: Yves Gingras</b> CRC, History and Sociology of Science, Université du Québec à Montréal <i>The "Templeton Effect" and the Rise of the Science and Religion Industry</i> Morisset 218</p>		

# CSHPS Programme Day 3: Monday, June 1st

8h45-10h45	<p>12. Cognition, Language, &amp; Emotion Morisset 218</p> <p><b>Sarah Arnaud</b>, UQAM et Paris-Sorbonne <i>Conscience ou accès? Vers un nouveau modèle de notre rapport aux émotions</i></p> <p><b>Guillaume Beaulac</b>, Yale University <i>The Role of Language and the Architecture of Cognition</i></p> <p><b>Léa Derome</b>, Université de Montréal <i>Aristotle on Brain Functions and Intelligence</i></p> <p>Chair: Vincent Guillin, Université du Québec à Montréal</p>	<p>The historian's craft: international perspectives Joint session with CHA and Folklore Studies Association of Canada Location TBA</p> <p>Facilitators/Animateurs: <b>Jules Racine-St-Jacques &amp; Van Troi Tran</b>, Université Laval</p> <p><b>Vincent Auzas &amp; Maryline Crivello</b>, CNRS-Paris/Université de Provence <i>"Histinéraires. L'Histoire telle qu'elle se raconte," un programme de recherche ANR</i></p> <p><b>Christian Delacroix</b>, Université Paris-Est <i>La question de la subjectivité en histoire: la thématization introuvable</i></p> <p><b>Valérie Lapointe-Gagnon &amp; Maria Neagu</b>, York University <i>Les historiens par eux-mêmes : considérations autour d'un projet de recherche</i></p> <p><b>Doug Munro</b>, University of Queensland <i>Being an Historian in Different Settlings</i></p> <p><b>Patrick-Michel Noël</b>, Université Laval <i>Le métier d'historien peut-il et devrait-il se dire? Les historiens sur l'épistémologie</i></p> <p>Commentator/Commentateur: <b>Chad Gaffield</b>, University of Ottawa</p>
10h45-11h00	Coffee Break in Morisset 218	
11h00-12h30	<p>12. Cognition, Language, &amp; Emotion (con't) Morisset 218</p> <p><b>Garson Leder</b>, University of British Columbia <i>Cognition, Emotion, and Causes: Questioning the Theoretical Foundations of CBT</i></p> <p><b>Jonathan Life</b>, University of Western Ontario <i>On Norms and Communication in Linguistic Science</i></p>	<p>13. Philosophy of Math Morisset 205</p> <p><b>James Robert Brown</b>, University of Toronto <i>Mathematical Evidence: Pure vs Applied</i></p> <p><b>Bradley Zurcher</b>, Simon Fraser University <i>Threshold Concepts in Formal Logic</i></p> <p>Chair: Jason Grier, York University</p>
12h30-13h30	<p>Big Thinking Lecture: Monique Proulx <i>Extrêmement vaste et incroyablement près : Le territoire intérieur de Montréal</i> (Extremely vast and incredibly near: The inner world of Montreal) Sciences sociales FSS 4007</p>	
13h30-15h00	<p>Plenary Session Morisset 218</p> <p><i>Science &amp; Narratives of Nature, East &amp; West – An Encounter</i> <b>Stephen Bocking</b>, Trent University; <b>Yiftach Fehige</b>, University of Toronto; <b>Daryn Lehoux</b>, Queens University; <b>Gordon McOuat</b>, King's/Dalhousie University; <b>Letitia Meynell</b>, Dalhousie University; <b>Kathleen Okruhlik</b>, University of Western Ontario; <b>Sergio Sismondo</b>, Queen's University</p>	

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**congress 2015**  
OF THE HUMANITIES AND SOCIAL SCIENCES

There are, however, important points of contact and similarity. Both started out as physicists, and their times at Harvard overlapped for about 15 years. Both participated in James Conant's General Education Program, and participation in that program was a major factor in the development of their later views. Finally, of course, Kuhn's *Structure* was published as the final volume of the *International Encyclopedia of Unified Science*, with which Frank had been associated from the very beginning. The somewhat contentious claim made in this paper is that Philipp Frank may (in certain important respects) be a better match than Thomas Kuhn for 21st-century philosophy of science. Session 7.

**Orenstein, David** University of Toronto

*The June 1938 AAAS Salmon Symposium in Ottawa: Its Genesis, The Event and Its Influence*

The Summer 1938 Meeting in Ottawa of the American Association for the Advancement of Science (AAAS) featured a symposium on "The Migration and Conservation of Salmon", organized by A. G. Huntsman, Professor of Zoology at the University of Toronto and Director of the Atlantic Biological Station of the Fisheries Research Board of Canada. Papers came from across Canada and the United States and also from the United Kingdom, by such noted fisheries biologists as Henry B. Ward, W. A. Clemens and W. J. M. Menzies. The goal was to look beyond the "homing instinct" of salmon to return to their hatching stream to more measurable environmental factors. There is extensive documentation for the symposium in the A. G. Huntsman Fonds at the University of Toronto Archives, permitting examination of its genesis, the event and its influence. In particular the production and the reach of the published proceedings *The Migration and Conservation of Salmon*, Publication of the AAAS No. 8 (1939) will be studied. This paper is part of a larger project investigating the impact of early international scientific congresses held in Canada. Session 12.

**Peacock, Kent** University of Lethbridge

*"Where Are They?" Fermi, Lotka, and the Long Odds of Survival in a Dangerous Universe*

In 1950, Enrico Fermi guesstimated the probability as nearly unity that Earth should have been visited by extra-terrestrials. And yet, there is still no unambiguous evidence of extra-terrestrial visitation or contact. This leaves us with Fermi's Question: "Where are they?" The puzzle is heightened by the recent discovery of numerous exoplanets and estimates that there may be a billion Earth-like planets in our galaxy alone. While Fermi's Question is probably not urgent (compared to problems like climate change) it is very important, since it implies that there is something major about the universe that we do not understand. Robin Hanson proposed that there may exist a "Great Filter," some mysterious factor that

reduces the chance that life will develop into technologically advanced forms. I propose that Lotka's Law is a good candidate for the Great Filter. Consider a population of entities subjected to a succession of pass-fail trials. A. J. Lotka showed that there is an inverse relation between the number of pass-fail trials and the number of individuals who survive those trials. An evolving species will from time to time experience existential crises, which the species either survives or does not. By Lotka's rule, only a tiny number of species may survive enough existential crises to make their existence noticeable on a galactic scale. The answer to Fermi's Question, therefore, could lie in the grim statistics of survival in a dangerous universe. Session 5.

**Ray, Nicholas** University of Waterloo/ Wilfrid Laurier University

*Scientific Empiricism and the Given*

The story of "scientific philosophy" is inextricably interwoven with the history and prehistory of logical empiricism. That story is one of impressive philosophical ingenuity, especially regarding technical matters in *Wissenschaftslogik*. The failures of logical empiricism were equally impressive: the gap between subjective experience and world could not be bridged; the logic of confirmation could not be settled; the theory of theories could not be defended; etc. This paper argues that distinctive features of logical empiricist doctrine are less responsible for the collapse of logical empiricism than their unreflective adoption of common theses in general epistemology, especially regarding what is given in experience. Further, contemporary post-positivist candidates for a new scientific empiricism have yet to address the problematic relationship between experience, evidence, and theory, often choosing not to address the issue at all. I will argue that this tactic makes it hard to see how such candidates for scientific empiricism fit within the empiricist tradition, and that the successes of, say, Constructive Empiricism, or empiricist theories of confirmation, ought to be taken with a grain of salt if they remain silent regarding the role of experience in producing knowledge. A scientific empiricism that addresses the contribution of experience for our knowledge ought to be favoured over those that merely "capture the phenomena" or explain the process of theory revision in light of a "downstream" notion of evidence. The upshot: we can already discern the contours such a new scientific empiricism, and it addresses problems with the given. Session 7.

**Record, Isaac** University of Toronto

*How simulations become evidence*

I trace the rise in status of Monte Carlo simulation from its initial use in the Manhattan Project as an auxiliary heuristic to the seventies, when simulation results were regularly accepted as scientific evidence. I argue that this rise in status depended on the production and communication of "practices of trust" that subsumed Monte Carlo under accepted scientific



standards. Ulam, von Neumann, and Metropolis developed Monte Carlo for use in cases where analytic methods proved intractable and direct experiments too dangerous or expensive. Monte Carlo was intended as a heuristic, a way for scientists to gain insight into intractable analytic equations so that they could be simplified for hand-calculation. But the calculations quickly came to be accepted as scientific evidence in their own right. The question is how this initially contested method became an acceptable source of scientific evidence. An analysis of the early published papers that introduced Monte Carlo to various scientific communities reveals that these papers implicitly or explicitly include arguments for the acceptance of Monte Carlo results. As the method developed and spread, scientists renegotiated standards of evidence in order to include evidence from the new practice, and at the same time they modified the practice itself to be ever more compatible with existing standards. Of particular importance for the acceptance of Monte Carlo was the development and communication of the practices of trust that gave scientists confidence in the validity and appropriate use of simulation results. I detail several such practices and argue that they were co-produced with the simulation during its design. Session 3.

**Rosario, Esther** University of Alberta

*Evolutionary Explanations of Female Sexuality: Combining Feminist Values and New Empirical Perspectives*

My paper explores the roles social values, particularly feminist values, and social biases play in evolutionary explanations of female sexuality, including human and non-human primates. I contend that in the case of female sexuality, bias in scientific practice leads to incomplete and empirically unfounded theories of female sexual and reproductive social behaviour. In particular, I hold that evolutionary theories such as sexual selection theory benefit from being assessed in light of feminist values. Furthermore, I argue that incorporating feminist values into theory choice helps correct social bias within evolutionary theory and yields more complete and accurate biological explanations. In so doing, I examine Elisabeth Lloyd's criticism of adaptationist accounts of female sexuality that reduce all sexual behaviours in female primates to reproduction. However, I demonstrate how evolutionary biologist Joan Roughgarden's alternative to sexual selection, social selection theory, complements and goes beyond Lloyd's criticism. While Lloyd rightly objects to the exclusive focus on female mating behaviour in the study of female sexuality, I argue she does not do justice to the research interests of those who study how sexual behaviour enhances fitness and she does not offer an evolutionary agenda. I maintain that Roughgarden's view fills this explanatory gap by not merely elucidating flaws in theories of female sexuality that reduce sexual behaviour to mating, but by showing how a diversity of sexual and gender related behaviours comprises a social sys-

tem (rather than simply a mating system) that promotes evolutionary success. Session 10.

**Rousseau, Jean-Jacques** University of Toronto

*Is Newton to Einstein What Vinyl Is to MP3s: The Problem of Backward Compatibility in Science*

Two widely accepted facts about science are not easily reconciled: disciplines change in innovative ways and progress requires communication across these changes. In 1962 Thomas Kuhn, a leading voice on the question, formulated the problem as being about the character and structure of scientific revolutions. Although his vocabulary is part of intellectual vernacular, his framework is hotly contested. For example, critics have argued against the coherence of paradigms (Masterman), questioned whether anomalies always presage revolution (Chang), and even denied that shifts occur at all (Kitcher). Yet there is no alternative framework for the core tension between innovation and progress. Also, there is the troublesome issue of forgetting that Heinz Post called "Kuhn loss". All this is not unlike the compatibility issues faced by users of technology. Just like Newtonian mechanics doesn't steadily develop into relativity, the innovations from record player to iPod do not trace a progressive increase in sound fidelity. And there are the losses in resolution from analogue to digital (Neil Young). This "fast history" is suggestive. Some upshots guided by the work of business theorist Clayton M. Christensen on disruptive technological change: 1. The traditional debate centered about a false choice between innovation and progress; 2. Letting go of homogeneity in paradigms sidesteps it; 3. The core metaphor of translation gives way; and 4. Replaced with one of language formation. Session 7.

**Samaroo, Ryan** University of Bristol

*The Principle of Equivalence is a Criterion of Identity*

In 1907 Einstein had an insight that he referred to as 'the happiest thought of my life'. This insight has been formalized in a principle called 'the equivalence principle'. This is the hypothesis that it is impossible to distinguish locally between immersion in a homogeneous gravitational field and uniform acceleration. The principle motivated a critical analysis of the Newtonian and special-relativistic inertial frame concepts, and it was indispensable to Einstein's argument for his gravitation theory. A great deal has been written about the equivalence principle. Some of this work has focused on the principle's approximate character and the limits of what it can be taken to establish (e.g., Pauli, 1921; Anderson and Gautreau, 1969). Other work focuses on conceptual tangles that the principle supposedly raises (e.g., Eddington, 1923; Synge, 1960; Ohanian, 1977; Norton, 1985). Still other work (e.g., Okon and Callendar, 2011) examines the equivalence principle with an eye to quantum theory. This work is important. But it largely neglects the methodological analysis of the principle. A methodological

analysis must consider two basic questions: What kind of principle is the equivalence principle? What is its role in the conceptual framework of gravitation theory? I offer new answers to these questions. The idea I am developing is that the principle is not at all about equivalence—in the sense of proportionality or behavioural indistinguishability—but about the recognition that two previously distinct concepts of motion are identical. I will argue that the equivalence principle should be understood as a criterion of identity. Session 5.

**Sawkins, Corey** University of Guelph

*The Explanatory Role of Spacetime in Physics*

The role that spacetime plays in explanations in contemporary physics, particularly in special and general relativity, is a point of contention among philosophers of science. Harvey Brown (2005) for one argues that spacetime plays no explanatory role that it is a glorious nonentity without causal efficacy. Michel Janssen (2009), one of the strongest supporters of the explanatory value of spacetime, agrees with Brown that spacetime is not substantival for it is not causally efficacious, but argues that the structure of spacetime still plays a role in explanation in special relativity. To argue this point Janssen uses what he calls a common origin inference account of explanation, according to which special relativity explains relativistic phenomena by tracing them back to a common origin. In this paper I argue that, contra Janssen and Brown, the role that spacetime plays in explanation in STR is best understood if we consider spacetime to be substance and a substantival spacetime does not imply that spacetime is causally efficacious in STR. Secondly, I argue that the role that spacetime plays in explanation in special relativity is best understood if we characterize these explanations using Kitcher's unificationist account (1981, 1989). This is because Kitcher's account best captures the role of spacetime in explanations in special relativity. I then conclude with a short discussion of the role that spacetime plays in explanations in general relativity. Session 5.

**Silk, Matt** University of Waterloo

*John Dewey on Values in Science*

Recently, philosophers like Matt Brown, Mark Tschaep, and Peter Godfrey-Smith have provided accounts of John Dewey's philosophy of science. Those who examine Dewey usually agree that Dewey considered science to be a value-laden activity and that values can and should play a role in scientific practice. However, few examine Dewey's thoughts on the specific role that values play in science. Dewey's theory of inquiry, for example, asserts that inquiry starts within a given contextual situation where cultural and social values are relevant. He also has a lot to say about values and the role of science in a society. But in Dewey's writings

on scientific approaches to valuation and to social planning, he often stresses the neutral nature of science as an instrument for inquiry. This presents a conflict between how science qua science works and the role of science in a society; Dewey believes that scientific inquiry can determine what our values ought to be, but if science is value-laden, then this seems problematic. My paper will clarify this tension in Dewey's writings and explain his position on what role values play in scientific inquiry. Session 10.

**Sutherland, Callum** York University

*Dashed Hopes: The Fraser River Fisheries Collapse of 2009*

Having endured more than a decade of dwindling returns on sockeye salmon, Fraser River fisheries were clamouring for positive news as the 2009 fishing season approached. Into this vacuum stepped Fisheries and Oceans Canada ("DFO"), whose pre-season forecast called for a return of 10.6 million sockeye with a 50% probability level. The hope thus generated by this forecast was dashed by actual returns that fell well short of two million, making 2009 the least-productive season on record. Demands for a judicial inquiry soon proliferated the public discourse, with many citing the disparity between the forecasted and actual returns as evidence of the DFO's mismanagement of the fishery. Following in the footsteps of Joe Dumit (2004), I will argue that the DFO lost control over the meaning of its forecast as it travelled. By following the forecast, in other words, I will show how it came to be stripped of its accompanying probability level. While creating the impression that the DFO mismanaged the fishery, this apparent absence of uncertainty also serves as the primary source of the DFO's epistemic authority over management of the fishery. By mapping the contours of this central tension, my talk will explore the significance of these developments for the future of scientific fisheries management. Can this tension be addressed? Must fisheries management be 'scientific'? By reconstructing the travails of this forecast—from its initial inception, through to the eventual judicial inquiry, and beyond—my talk will bring a unique perspective to bear on these important questions. Session 2.

**Turri, John** see **Michaud** for abstract on pages 11-12.

*Three Factors that Affect the Credibility of Scientific Research*

**Weidenhammer, Erich** University of Toronto

*Recreating August Kirschmann's "Colour Mixing Apparatus": An Exercise in the Tactile History of Science*

In 1903, the instrument catalogue of the Zimmermann atelier in Leipzig Germany listed a "Colour mixing apparatus"—a double axel colour wheel—that had been designed by August Kirschmann (1860-1932). Kirschmann, formerly a student of the famous "father of psychology" Wilhelm Wundt (1832-1920), was then a professor of psychology at the University of Toronto. During Kirschmann's tenure in Toronto he trans-

formed the psychological laboratory into a centre for the research of colour and colour perception. His colour mixing apparatus was one of a number of similar instruments used in his laboratory. This paper describes my efforts to produce a functional (as opposed to cosmetic) recreation of this instrument using 3d-printed parts. It discusses the value of tactile history of science as a form of research. It also discusses the use of colour wheels in general as a valuable pedagogical tool in explaining the nature of colour vision and experimental practice. This project is carried out in collaboration with Gabby Resch, graduate researcher at Semaphore Lab at the University of Toronto. Session 8.

**Wright, Jessey** University of Western Ontario

*Data Analysis and the Evidential Scope of Neuroimaging Results*

In one of her contributions to the debate about the epistemic status of neuroimaging, Adina Roskies (2010) argues that determining the status of neuroimaging requires a characterization of the inferential distance between the experimental results and the phenomena those results are about. Doing so entails identifying and evaluating "... the inferential steps that mediate between observations and the phenomena they purport to provide information about" (2010, 197). In this paper I argue that (1) data analysis techniques transform observations into evidence and, thus (2) the choice of data analysis technique is a significant inferential step because it places constraints on the evidential scope of the analysis results. I do this through the analysis of a case study. Liu and colleagues used subtraction and pattern classification analysis to analyze neuroimaging data collected while participants performed a range of visual attention tasks (Liu et al 2011). In the context of this case study I illustrate the difference in evidential scope between the results of the two data analysis techniques. Subtraction is used to identify regions of the brain that are active between two tasks, while pattern classification analysis characterizes the informational content of the measured activity with respect to the tasks performed. By carefully analyzing how they are implemented, I show how the application of different techniques to the same observations (data) can result in evidence about different phenomena. I conclude by suggesting how this understanding of data analysis techniques might impact other debates within the philosophy of science. Session 6.

**Yakubu, Yussif** McMaster University

*A Profile of Contemporary Darwinian Explanation*

Two major theoretical difficulties have plagued the Darwinian paradigm since its inception. They are the problem of heredity and the problem of social behaviour. The latter is widely acknowledged to be on-going, and is today a bustling field of theoretical research. With regards to the former however, there is a general illusion that it was resolved nearly a

century ago with the adoption of Mendelian genetics and the advent of the modern synthesis. I argue here, that the problem of heredity is still at the root of contemporary Darwinian theoretical difficulties, particularly, the problem of social behaviour. Two watershed events in the history of Darwinian Theory have been profoundly instrumental in shaping contemporary evolutionary explanation. The first was during the 1930s and 1940s when the modern synthesis took shape, and the second occurred in the 1960s and 1970s, during which the synthesis began a reverse process of contraction with the emergence and ascendancy of the "gene's-eye view" of Darwinian evolution and its systematic rejection of the other explanatory traditions within the synthesis. Even though both events were centered on heredity and the affirmation of Mendelian genetics, the character and ramifications of the events of the 1960s and 1970s have not been much appreciated. As a consequence of the theoretical upheaval of the 1960s and 1970s, the best genetic explanations of social behaviour today are abstract mathematical models. Since none of these models reflect the true genetics of social behaviour, can we say the Darwinian problem of heredity is resolved? Session 1.

**Zurcher, Bradley** Simon Fraser University

*Threshold Concepts in Formal Logic*

The grade distributions for introductory logic courses frequently exhibit high levels of bimodality, dividing the students into two groups: those who competently grasp the core logical concepts and techniques and those who do not. It makes the teaching of logic particularly challenging, since "teaching to the mean" is rather ineffective. Our work seeks to understand the causes of this phenomenon and to devise means of curbing this effect. We hypothesize that a student's comprehension of core threshold concepts is the most robust causal factor with significant predictive power. Threshold concepts share a variety of features which bear directly upon the ability of a student to make further progress in the subject, i.e., they are integrative hinges which bind different concepts together and they are irreversible in that they prove difficult to unlearn. These concepts thus play a major cognitive role irrespective of their conceptual role. Nonetheless, in this exploratory phase, we also hypothesize that threshold concepts correspond to focus points in standard philosophical understanding of logical methodology. From preliminary data gathered from introductory logic courses, we perform a regression analysis in order to identify the extent to which particular concepts act as threshold concepts. As we show, studying these concepts underscores pathways for an improved student understanding of logical concepts, techniques, and methodology. In the process of identifying this cognitive pathway, we also clarify some important conceptual nuances in formal logics. Session 13.



## Local Information

### Getting to Ottawa

(More information about transportation in Ottawa can be found here: <http://congress2015.ca/plan-your-trip/travel>)

#### *By Plane*

The MacDonald-Cartier Airport is situated at a good distance from Ottawa's centre. You have to plan a 30-minute or so travel by taxi from there to get to the University (and thus, with no traffic, a \$30 ride), or take public transit (much less expensive, tickets can be bought at the Airport): the OC Transpo 97 line will bring you to the Congress campus in 35-45 minutes. For more details: <https://yow.ca/en/parking-transportation/transportation>.

#### *By train*

The train station is not too far from Ottawa's centre. It is a 10-minute taxi ride, but you can also take the public transit (OC Transpo, line 95) from there. More details: <http://www.viarail.ca/en/explore-our-destinations/stations/ontario/ottawa/station>

#### *By Bus*

If you take the bus, you will arrive at Central Station. It is a very short run in taxi to the University, but it is also possible to do it by public transit (see here), or even walk (it is a 30-minute walk to the University). If you take the bus from Montreal, you can always ask the driver: they sometimes stop at the University of Ottawa.

#### *By Car*

If you come by yourself by car, take note that parking is expensive in Ottawa. Most hotel rooms charge an extra near-\$20 for parking. Here is what the Congress organizers have to say on this:

"There is very little parking on and around the main campus. You are encouraged to walk, take public transit, leave your car at your hotel or take a taxi. However, there is a limited number of parking spaces in university garages, which are equipped with Pay and Display machines for short-term parking. The cost is \$16 per day or \$4.50 per hour. Cash and credit cards are accepted."

### Stay in Ottawa

Congress organizers have blocked rooms in most hotels near campus. You can find the list here (<http://congress2015.ca/plan-your-trip/accommodations>). There are some rooms at the University residences starting at \$40; otherwise, most hotels chosen by the organizers are starting at \$175.

For your day-to-day basis needs, public transportation is the best choice: there is a lot of construction in Ottawa downtown these days, as the city being revamped for the 2017's festivities around Canada's 150-year anniversary. If you need a taxi, here are two companies you can reach: Blueline Taxi (613-238-1111); Capital Taxi (613-744-3333)

Ottawa-Gatineau has a wonderful network of bicycle paths (see what it looks like here: <https://www.google.ca/maps/@45.3974575,-75.7126748,12z/data=!5m1!1e3?>). If you need to rent a bike, you can go here: <http://www.rentabike.ca>.

### Eat in Ottawa

During Congress hours, you will have multiple places to eat—some of them are the usual franchises (Tim Hortons, Second Cup...), others are small food trucks or cafés. A popular one is the Nostalgica (603 Cumberland Street, on campus), which is administrated by the Graduate Student's Association. After Congress hours, if you're looking for a place to have a good dinner, the best plan is to walk to the Byward Market (<http://www.byward-market.com/>). There, you can find a great variety of restaurants, with a wide range of prices, menus and atmospheres.

### Recreation in Ottawa

The Montpetit Sport Center will be open for Congress attendees for a \$5 per day fee.

### Childcare

If you have brought your children with you, the University has two plans: a child minding service for those 6 months to 5 years old (for any question, contact Elise Detellier: [edetelli@uottawa.ca](mailto:edetelli@uottawa.ca) or 613-562-5800, ext. 7418), and a Congress sports day camp for 5- to 12-year-olds, run by the Gee-Gees, the UofO sports teams (more info here: <http://congress2015.ca/plan-your-trip/local-amenities/child-minding>).

## Maps

Congress organizers have created a few interactive on-line maps that can be found here: <http://congress2015.ca/plan-your-trip/maps>.

*Mitia Roulx-Beaulne (Ottawa),*

*Program Committee 2014-2015 (Local Arrangements)*

*Traduction par Vincent Guillin (voir ci-dessus)*

## Sur place

### Venir à Ottawa

Vous trouverez toutes les informations pertinentes ici: <http://congres2015.ca/planifiez-votre-voyage/dispositions-de-voyage>

#### *En avion*

L'aéroport MacDonald-Cartier est situé à une certaine distance du centre d'Ottawa. Vous devez compter aux alentours de 30 minutes en taxi pour vous rendre à l'Université (pour une course de 30\$, en temps normal), ou un trajet de 35 à 45 minutes si vous empruntez les transports publics (bien moins onéreux, les billets peuvent être achetés à l'aéroport) : la ligne OC Transpo 97 vous conduira sur le site du Congrès. Pour plus de détails : <https://yow.ca/fr/transport-et-stationnement/moyens-de-transport>.

#### *En train*

La gare ferroviaire n'est pas très loin du centre d'Ottawa. Le trajet en taxi prend aux environs de 10 minutes, mais vous pouvez aussi emprunter les transports publics (OC Transpo, Ligne 95) à partir de la gare. Pour plus d'informations: <http://www.viarail.ca/fr/decouvrez-nos-destinations/gares/ontario/ottawa>

#### *En autocar*

Si vous prenez l'autocar, vous arriverez à la Gare centrale. Le trajet pour l'université est très court, mais il est aussi possible d'utiliser les transports publics (voir ici), voire de s'y rendre à pied (en environ 30 minutes). Si vous arrivez de Montréal, vous pouvez toujours demander au chauffeur de vous laisser descendre à l'Université d'Ottawa.

#### *En voiture*

Si vous venez par vos propres moyens en voiture, notez

que le stationnement est cher à Ottawa. La plupart des hôtels demandent aux alentours de 20\$ en extra pour le stationnement. A cet égard, voilà ce que préconisent les organisateurs du Congrès :

« Il y a très peu de places de stationnement disponibles aux alentours et sur le campus lui-même. Nous vous encourageons à marcher, à utiliser les transports publics, à laisser votre voiture à l'hôtel ou à prendre un taxi ».

Il existe néanmoins un nombre restreint de places de stationnement dans les garages de l'université, qui sont équipés d'horodateurs pour le stationnement non résidentiel. Le prix est de 16\$ par jour ou 4.50\$ par heure. Espèces et cartes de crédit acceptées ».

### Séjourner à Ottawa

Les organisateurs du Congrès ont réservé des chambres dans la plupart des hôtels proches du campus. Vous en trouverez la liste ici (<http://congres2015.ca/planifiez-votre-voyage/hebergement>). Des chambres sont aussi disponibles dans les résidences de l'Université, à partir de 40\$ ; les hôtels sélectionnés par les organisateurs ont des tarifs qui commencent à 175\$.

Pour vos déplacements quotidiens, les transports publics sont la meilleure option : beaucoup de travaux sont en cours en ce moment dans le centre d'Ottawa, la ville subissant une rénovation en vue des festivités entourant le 150e anniversaire du Canada en 2017. Si vous avez besoin d'un taxi, vous pouvez faire appel à deux compagnies : Blueline Taxi (613-238-1111); Capital Taxi (613-744-3333).

Ottawa-Gatineau dispose d'un fantastique réseau de pistes cyclables (vous pouvez voir à quoi il ressemble ici: <https://www.google.ca/maps/@45.3974575,-75.7126748,12z/data=!5m1!1e3?hl=en>). Si vous aviez besoin d'un vélo, vous pouvez vous rendre ici: <http://www.rentabike.ca>.

### Manger à Ottawa

Pendant les sessions du Congrès, vous pourrez vous restaurer dans de nombreux lieux différents – aussi bien les enseignes habituelles (Tim Hortons, Second Cup) que des camions de denrées ou des cafés. Un endroit populaire est le Nostalgica (603 Cumberland Street, sur le campus), qui est géré par l'Association

des étudiants des cycles supérieurs. En dehors du Congrès, si vous cherchez un endroit pour souper, la meilleure option est de se promener dans le Byward Market (<http://www.byward-market.com/fr/index.htm>). Vous y trouverez une grande variété de restaurants, avec une grande variété de prix, de menus et d'atmosphère.

### **Se divertir à Ottawa**

Le Centre sportif Montpetit Sport sera accessible aux congressistes à un tarif journalier de 5\$.

### **Garde d'enfants**

Pour vos enfants, s'ils vous accompagnent, l'Université dispose de deux services différents. Un service de garde pour les enfants de 6 mois à 5 ans (pour toute question, contacter Elise Detellier: [edetelli@uottawa.ca](mailto:edetelli@uottawa.ca) ou 613-562-5800, ext. 7418). Pour les 5 à 12 ans, les Gee-Gees (l'équipe sportive de l'UdeO) organisent un camp de jour créé spécialement pour le Congrès (plus d'informations ici: <http://congres2015.ca/planifiez-votre-voyage/attraits-locaux/garde-denfants>).

### **Plans**

Les organisateurs du Congrès ont créé plusieurs cartes interactives en ligne que vous pouvez trouver ici: <http://congres2015.ca/planifiez-votre-voyage/cartes>.

## **Capital Ideas**

<http://congres2015.ca/about>

### **About Congress**

Unrivalled in scope and impact, the annual Congress of the Humanities and Social Sciences is the convergence of approximately 70 scholarly associations, each holding their annual conference under one umbrella. Now in its 84th year, this flagship event is much more than Canada's largest gathering of scholars. Congress brings together academics, researchers, policy-makers, and practitioners to share findings, refine ideas, and build partnerships that will help shape the Canada of tomorrow.

Typically spanning seven days in late May and early June, and attracting an average of 8,000 attendees, Congress is organized by the Federation for the Humanities and Social Sciences and hosted by a different

Canadian university each year. The Federation, host university, scholarly associations and partners develop a full week of presentations, workshops, panels, public lectures, cultural events and receptions. It also features Canada's largest academic trade show. The result? Luminaries, researchers, practitioners, policy-makers and students from across Canada and abroad meet, share ideas and engage in discussions that have direct importance for Canada and the lives of Canadians.

Congress programming is open to attendees, academics and non-academic audiences. From theatre research, literature studies and history to education, sociology and communications, Congress represents a unique showcase of scholarly excellence, creativity, and leadership.

Congress 2015 is being hosted by the University of Ottawa in Ottawa, Ontario. The theme for this year's Congress is "Capital Ideas."

### **About the University of Ottawa**

Located in the heart of the nation's capital with ready access to national institutions, the University of Ottawa is the world's largest bilingual university (English-French). With more than 40,000 students and close to 1,300 professors, it is at the cutting edge of Canadian and international research, while providing an outstanding student experience at both the undergraduate and graduate levels. Ranked seventh among Canada's most research-intensive universities, it attracts top scholars and researchers and forges links with innovators the world over. The University of Ottawa is committed to excellence in four strategic areas: the student experience, research, international endeavours and bilingualism. It is a crossroads of cultures and disciplines where researchers work together to find creative solutions to today's challenges.

For more information, please go to [www.uottawa.ca](http://www.uottawa.ca).

### **About the Federation for the Humanities and Social Sciences**

The Federation for the Humanities and Social Sciences promotes research, learning and an understanding of the contributions made by the humanities and the social sciences towards a free and democratic society. Established in 1940, with a membership now compris-

ing 160+ universities, colleges and scholarly associations, the Federation represents a diverse community of 85,000 researchers and graduate students across Canada. The Federation organizes Canada's largest academic gathering, the Congress of the Humanities and Social Sciences, bringing together more than 8,000 participants each year.

For more information about the Federation, visit [www.ideas-idees.ca](http://www.ideas-idees.ca).

## Le capital des idées

<http://congres2015.ca/propos>

### À propos du Congrès

Inégalé pour sa portée et son impact, le Congrès annuel des sciences humaines est le lieu de convergence d'environ 70 associations de recherche, qui y tiennent ensemble leurs conférences annuelles. Parvenu à sa 84<sup>e</sup> édition, cet événement phare unique en son genre constitue beaucoup plus que le plus important rassemblement d'érudits. Le Congrès regroupe des universitaires, des chercheurs, des responsables de politiques et des praticiens désireux de mettre en commun leurs découvertes, de parfaire des idées et de créer des partenariats qui aideront à façonner le Canada de demain.

S'étendant généralement sur sept jours vers la fin de mai et le début de juin, et attirant en moyenne 8 000 congressistes, le Congrès est organisé par la Fédération des sciences humaines. Il se tient chaque année dans une université canadienne différente. La Fédération, l'université d'accueil, les sociétés savantes et leurs partenaires déploient, une semaine durant, exposés, ateliers, tables rondes, conférences publiques, activités culturelles et réceptions. Le Congrès est également le lieu du plus important salon professionnel au Canada. Le résultat? Des personnalités éminentes et de nombreux chercheurs, praticiens, responsables des politiques et étudiants venant de partout au pays et d'ailleurs se rencontrent, échangent des idées, et participent à des débats qui revêtent une importance directe pour le Canada et la vie des Canadiens.

Élaborée chaque année de concert avec une université hôte, la programmation du Congrès est ouverte aussi bien aux congressistes qu'à un auditoire universitaire et

à un public de non-spécialistes. Du monde du théâtre, de la littérature et de l'éducation à des disciplines comme l'éducation, l'histoire, la sociologie et la communication, le Congrès déploie un éventail singulier d'excellence, créativité et prééminence intellectuelles.

L'Université d'Ottawa, située à Ottawa, Ontario, sera l'institution hôte du Congrès 2015 qui, pour cette édition, a retenu le thème « Le capital des idées ».

### À propos de l'Université d'Ottawa

L'Université d'Ottawa, la plus grande université bilingue (français-anglais) au monde, est située au cœur de la capitale nationale et jouit d'un accès direct aux grandes institutions du pays. Elle offre à ses plus de 40 000 étudiants et près de 1 300 professeurs un milieu à l'avant-garde de la recherche au Canada et à l'international, et une expérience d'apprentissage exceptionnelle tant au premier cycle qu'aux études supérieures. Classée septième parmi les universités à forte vocation de recherche au pays, l'Université d'Ottawa accueille les meilleurs professeurs et chercheurs et crée des liens avec des innovateurs partout au monde. Elle est fermement engagée dans la voie de l'excellence dans quatre domaines stratégiques : l'expérience étudiante, la recherche, les initiatives internationales et le bilinguisme. L'Université d'Ottawa est un carrefour de cultures et de disciplines où les professeurs collaborent pour trouver des solutions novatrices aux défis de notre temps.

Pour plus d'information, veuillez voir [www.uottawa.ca](http://www.uottawa.ca).

### À propos de la Fédération des sciences humaines

La Fédération des sciences humaines œuvre à la mise en valeur de la recherche et du partage des connaissances en sciences humaines pour une société libre et démocratique. Lancée sous sa forme initiale en 1940, la Fédération regroupe aujourd'hui plus de 160 universités, institutions et sociétés savantes représentant 85 000 chercheurs, membres du corps enseignant et étudiants au Canada. Elle organise le plus grand rassemblement d'universitaires au Canada à l'occasion du Congrès des sciences humaines, qui attire plus de 8,000 personnes chaque année. Pour plus de renseignements au sujet de la Fédération, visitez [www.ideas-idees.ca](http://www.ideas-idees.ca).



## Announcements

### Technological Unemployment and the Future of Work

Save the date: on June 3, 2015, the ISSP will be hosting a symposium on Technological Unemployment and the Future of Work at the 84th Congress of the Humanities and Social Sciences at the University of Ottawa.

The ISSP is hosting a half-day symposium which will address the idea that advances in technology and artificial intelligence may soon allow machines to replace workers in jobs traditionally thought to be unfit for automation such as airline pilot, accountant, and professor. The session will explore these themes by unpacking trends in emerging technologies and assessing their potential impact on jobs. Our keynote speaker will be Dr. Nick Bostrom of Oxford University and Director, Future of Humanity Institute (<http://www.fhi.ox.ac.uk/about/staff/>). Dr. Bostrom is an expert on the ethics and risks of artificial intelligence and is the author of the recent book *Superintelligence: Paths, Dangers, Strategies*. The symposium will also feature a response to the keynote by Wendell Wallach, consultant, ethicist, and scholar at Yale University's Interdisciplinary Center for Bioethics, followed by a panel discussion moderated by science journalist Peter Calamai featuring Nick Bostrom, Wendell Wallach, and Dr. Wendy Cukier, Vice-President of Research and Innovation, Ryerson University.

Visit the Congress 2015 event page: <http://congress2015.ca/program/events/unemployment-and-future-work>

Registration for Congress 2015 is now open: <http://congress2015.ca/register>

### John Austin Society 50th Anniversary Events

The 50th anniversary year celebration of the founding of the John Austin Society for the History of Medicine and Science ends with a flourish. The society is named after a Queen's University Professor of Surgery who served in WW1. In March Greg Baran in

full military regalia gave us moving anecdotes from a 1500 page WW1 diary ("A journey through Hell' The Firsthand Account of Kingston physician Dr Cumberland through the Trenches of World War I"). The concluding talk (April 16) by Sandra Campbell described a "World War I Military Nurse. The case of Kingston General Hospital's Annie Green." For details see: [http://post.queensu.ca/~forsdyke/john\\_austin\\_society.htm](http://post.queensu.ca/~forsdyke/john_austin_society.htm)

### Three Societies Meeting to Take Place in Canada June 22-25, 2016

Every four years the 3-Society Meeting brings together three organizations dedicated to the study of the history of science, technology, and medicine: the History of Science Society, the British Society for the History of Science, and the Canadian Society for the History and Philosophy of Science. 2016 will mark the Eighth Joint Meeting of the BSHS, CSHPS, and the HSS, this time in Canada at the University of Alberta in Edmonton, Canada. We are also in conversation with the European History of Science Society, which might join us in due course.



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We are very excited to welcome you all to the University of Alberta. Located in Edmonton, the capital of the province of Alberta, the University of Alberta is

home to almost 40,000 undergraduate and graduate students. It is one of the top 5 Canadian universities and ranks among the top 100 universities worldwide. The University of Alberta has more than 200 undergraduate programs and 170 graduate programs across 18 faculties. Scholars engaged in the study of the history, philosophy, and sociology of science, technology, and medicine are located within the Departments of History and Classics, Philosophy, Sociology, Economics, and in the Science Technology and Society Program and the Faculty of Medicine. The University of Alberta has also been home to one of the nodes of the Situating Science research project funded by a Social Sciences and Humanities Research Council of Canada Strategic Knowledge Cluster grant.

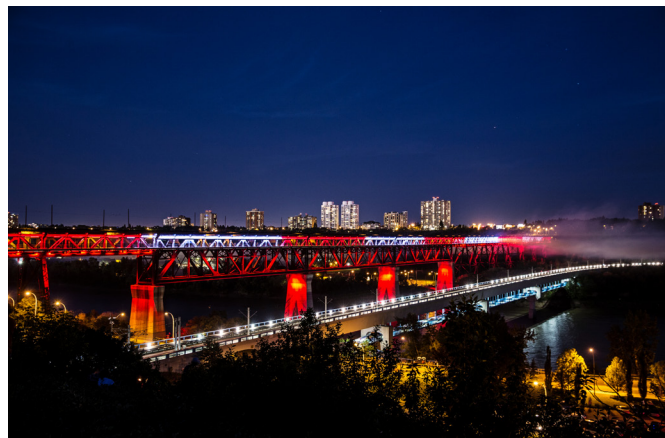


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The 3-Society Meeting will be held on the main campus of the University of Alberta, situated on the edge of the North Saskatchewan River valley across the river from downtown Edmonton. June is an ideal time for this conference, when you will be able to experience the abundant green space on campus at its best with average daily temperatures of 20°C and almost 17 hours of daylight. The Light Rail Transit (LRT) station located at the heart of the campus provides quick and easy transportation across the river to downtown dining, shopping, arts, and entertainment venues including the Francis Winspear Centre for Music, the Citadel Theatre, and the Art Gallery of Alberta. The University of Alberta is also located a short 20 minute walk from historic Whyte Avenue with its many restaurants and bars, coffee shops, and boutique stores. West Edmonton Mall, a world famous shopping and entertainment complex located in the west end of the city, is also easily accessible via transit from the University of Alberta as is the 124 Street district, a 10-block

area which is home to restaurants, boutique shops, and art galleries.

Centrally located in the province of Alberta, the city of Edmonton (with a population of more than 1 million) offers a number of advantages and attractions for the conference and extra-programme events. The conference events will be held just steps away from Edmonton's river valley park system—a 7400 hectare interconnected ribbon of urban parks on both sides of the North Saskatchewan river. Conference participants can enjoy walking in the river valley during breaks or take advantage of the park systems' many amenities including guided Segway tours and Edmonton's four municipal golf courses during their stay in the city. Edmonton is also known as "Festival City" and events which occur during late June include: The Works Art & Design Festival located throughout Edmonton's city centre; Improvoganza, a celebration of improv, comedy, and music held at the Citadel Theatre in downtown Edmonton; the Edmonton International Jazz Festival where internationally-recognized artists perform in venues throughout the city; the Freewill Shakespeare Festival where the works of the immortal bard are performed outdoors in Hawrelak Park which is located a short drive from the University of Alberta; and the Vocal Arts Festival which features some of Canada's finest emerging artists and is held in the Timms Centre for the Arts on the main campus of the University of Alberta, a 10 minute walk from the conference venue. Its location also makes Edmonton an ideal base for conference delegates who wish to explore the history and natural beauty of the province of Alberta either before or after the meeting. The Rocky Mountains, including



Courtesy of Edmonton Tourism

Jasper and Banff National Parks as well as the Royal Tyrell Museum and its world-famous collection of dinosaur fossils, are all located within a half-day's travel of the city. The drives to Jasper (3.5 hours), Banff (4 hours), and Drumheller (3 hours) are easy and along major roads. For those who do not desire to rent a vehicle, SunDog Tours offers a shuttle from the Edmonton International Airport to Jasper National Parks and a variety of sightseeing tours. Train travel to Jasper is also available through Via Rail and the Rocky Mountaineer.

We are putting together a joint program committee of the three Societies to ensure that we will have a lively and engaging program. Calls for papers will probably go out in early fall. The Three Societies conference is a chance to get together in a more relaxed, campus environment, and I hope you will all consider attending. You will not be disappointed.

For more information contact: [threesocieties2016@ualberta.ca](mailto:threesocieties2016@ualberta.ca)

*Lesley Cormack*

### **Reminders from the Website & Listserv Manager**

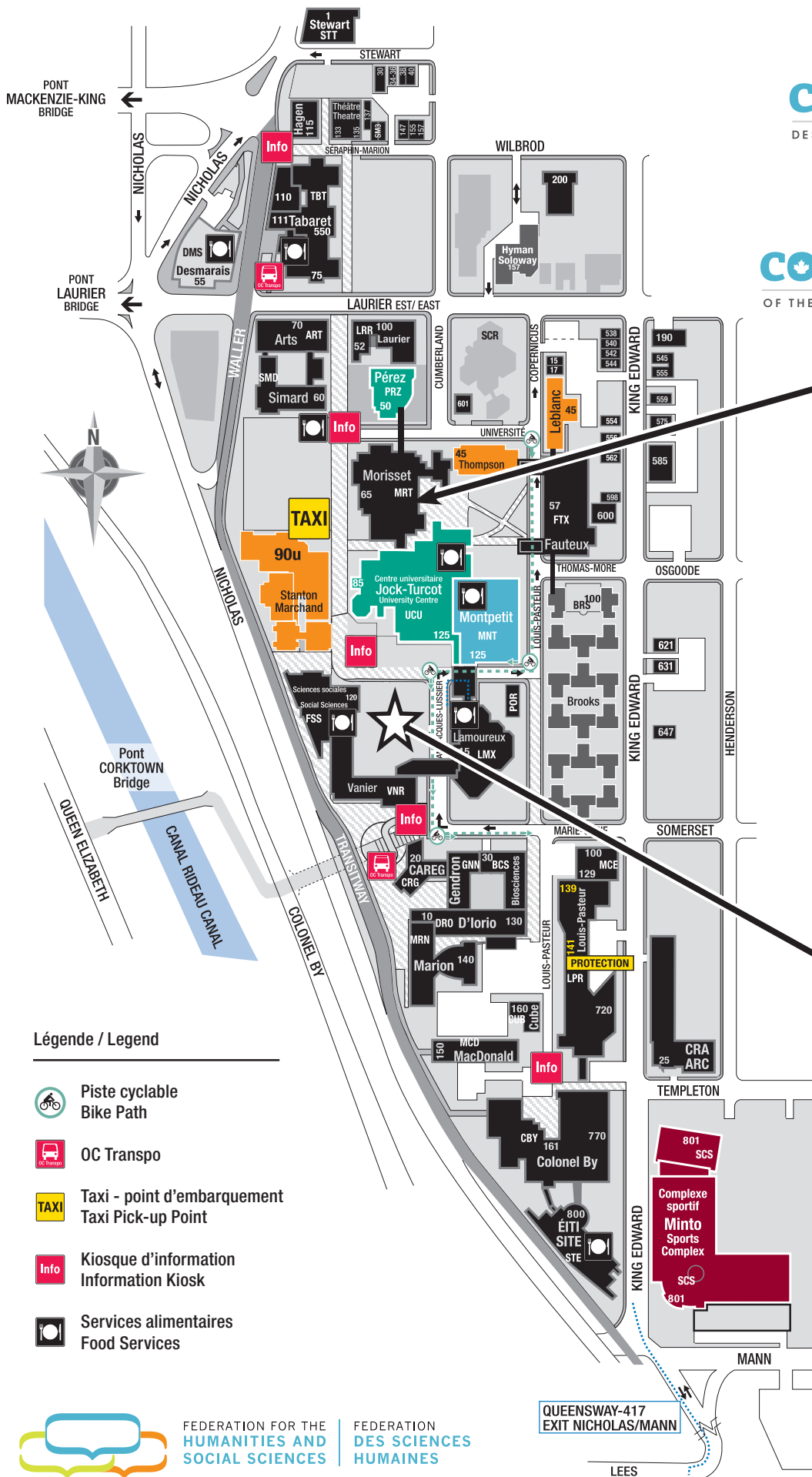
Members can share event announcements and other items of interest on our website, [www.yorku.ca/cshps1](http://www.yorku.ca/cshps1), or via our members-only email listserv.

For the listserv, please send items to [cshps@yorku.ca](mailto:cshps@yorku.ca) using the email you used to register for CSHPS. Please note that replies to listserv messages are directed to the original sender. To reply to the entire list, please send to [cshps@yorku.ca](mailto:cshps@yorku.ca). To update or remove your email address, please email [isaac.record@gmail.com](mailto:isaac.record@gmail.com).

For the website, please send items to [isaac.record@gmail.com](mailto:isaac.record@gmail.com). To report problems with the website, please click "contact webmaster" on any page.

To join CSHPS, please visit <http://www.yorku.ca/cshps1> and click "Join."





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DES SCIENCES HUMAINES

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