Session Abstracts for 2014 HSS Meeting

Sessions are sorted alphabetically by session title. Only organized sessions have a session abstract.

Title: The Alchemy of the Unexpected: Interpreting Alchemical Sources from Antiquity to the Seventeenth Century

Abstract: The history of alchemy has come into its own in recent years, with increasing attention paid to the theory, practice and context of chymia: whether concerned with metallic transmutation, medicine, spiritual insight, or technical procedures. The majority of studies continue to focus on early modern Europe, although the subject matter and stylistic conventions of alchemical writing were hardly unique to this time and place. From its roots in ancient recipe collections, alchemy flourished in Byzantine, Arabic and Latin territories: its procedures often characterized by a deliberately obscure and enigmatic approach to language that could be interpreted on multiple levels. From practical recipes to vernacular poetry and intricate emblem books, alchemical writings were used to convey more than just chemical knowledge – drawing on religious, magical, mathematical and even musical material, intended for a variety of audiences. Taking a comparative approach, this session will investigate how such knowledge was both concealed and revealed in chemical writings, often in unexpected ways, and across very different territories: Tudor England, Ottoman Turkey, early modern Germany, and ancient Assyria. We will ask what purpose the language and interpretation of alchemical sources served in such diverse environments, and what common themes may be discerned. Is it even possible to argue for an 'alchemical' approach to language in the very earliest records of technical procedures – centuries before the term chemeia was coined?

Title: Amerindian Knowledge and Science during the Long Enlightenment

Abstract: The debt that Enlightenment science owed to imperial and colonial endeavors has been the object of significant scholarly attention in recent years. However, Amerindian actors and knowledge most often appear as vehicles for information and objects of inquiry rather than as generative and constitutive of science itself. The panel seeks to explore the way that interactions between indigenous communities, and metropolitan and creole networks were fundamental to creating science in the "long" eighteenth century. The papers discuss networks and entanglements that connected naturalists and linguists in London, Stockholm, and Philadelphia to indigenous informants in Mesoamerica, New France, and the United States. The case studies explore the development of ornithology, botany, and linguistics in relationship to native actors and culture.

Title: Anthropological Engagement in the Postwar World

Abstract: In the years following the Second World War, anthropology in the Americas experienced an unprecedented moment of change. Recent literature has characterized this period as one of tremendous growth for the discipline, both in terms of its size and breadth of focus. Bridging the expertise of anthropologists and historians of science, this session contributes to these discussions with four studies highlighting significant transitions in anthropology during the second half of the twentieth century, emphasizing its gradual turn towards social and political engagement. To begin, Regna Darnell traces the discipline's changing intellectual landscape, underscoring the continuities and disjunctures of Boasian four-field anthropology after World War II. Her discussion centers on anthropology's push towards specialization and its response to postwar scientific positivism. Joshua Smith examines the organization and cohesion of the discipline by looking at the development of Current Anthropology. Founded by Chicago anthropologist Sol Tax, the journal provided an international forum for open scholarly communication exemplified by Tax's philosophy of action anthropology. Rosanna Dent also explores the discipline's proclivities towards action, showing how the interactions between anthropologists and Brazil's indigenous communities led to

the creation of a politically engaged Brazilian anthropology. Finally, Adrianna Link considers how Sol Tax promoted the use of anthropological perspectives for solving world problems by focusing on the activities of the Smithsonian Institution's Center for the Study of Man. Under the direction of Tax and S. Dillon Ripley, the Center became an international clearinghouse for urgent anthropology and an important example of collaborative research.

Title: Appraising Assessment: Defining Excellence, Competence, and Normalcy in the Nineteenth and Twentieth Centuries

Abstract: Scientists and non-scientists alike frequently look for ways to assess levels of quality, levels of achievement, or levels of deviance. These standards of assessment are often an unspoken, embedded feature of an institution or system, but they become visible when they are in the process of being created—or when they are called into question. The papers in this panel will explore systems of assessment in a variety of settings in the nineteenth and twentieth centuries, ranging from the Royal Society of London and the National Science Foundation to Victorian chemistry exams and pamphlets about sexuality. The papers by Alex Csiszar (Harvard University) and Matthew Lavine (Mississippi State University) analyze new standards of assessment as they were being developed; the papers by James Elwick (York University) and Melinda Baldwin (Harvard University) deal with systems of assessment that were being called into question after perceived failures. The papers consider why these systems of assessment were put into place, what they were designed to measure or evaluate, and how they reflect larger epistemological and cultural debates. Ted Porter (University of California-Los Angeles) will offer a synthetic commentary.

Title: Assessing Assessments

Abstract: Scientific assessments seem to promise to deliver on two lofty goals: science reviews that are peerless, seamless examinations of the state of research and communications that make sense to policy makers and their work. In a multi-year, interdisciplinary project, we use historical, philosophical, and ethnographic methods to understand how scientific assessments are conducted, how knowledge is produced within them, how assessors negotiate uncertainty, knowledge gaps, and disagreements, and how assessments are impacted by institutions, personalities, politics, and contingencies. We analyze case studies involving scientific questions about ozone hole, acid rain, the West Antarctic Ice Sheet and institutions including the Intergovernmental Panel on Climate Change and the National Academy of Sciences. Through our case studies, we propose that: 1) a central issue in assessments is the indeterminacy of the boundary between science and policy; 2) institutional context influences the outcomes of assessments in substantive ways; 3) assessments tend to produce conservative outcomes; 4) the demand, desire, or perceived need for consensus has a strong impact on outcomes; 5) assessors act not just as researchers, but also as scientist-authors, and the act of authorship affects the findings; 6) assessments are a domain of knowledge production, but their relationship to new knowledge varies widely.

Title: Between the Local and Global: National Pharmacopoeias in the Eighteenth and Nineteenth Centuries

Abstract: This session situates the creation and organization of scientific knowledge about pharmaceuticals at the intersection of local, national, and transnational processes. The establishment and promulgation of national pharmacopoeias during the eighteenth and nineteenth centuries can be understood as efforts to standardize knowledge and practice under normative frameworks that worked to advance national interests and aspirations. As such, these efforts inevitably confronted local forms of epistemic and therapeutic diversity, both in their efforts to consolidate this diversity under unified regimes of knowledge and in the fact that such diversity itself impacted the scope and direction of these efforts. At the same time, efforts to establish and promulgate national pharmacopoeias grew out of the extension of imperial power, the global circulation of therapeutic goods, the development of transnational networks of scientific knowledge and authority, and other complex dynamics that cannot be fully understood within the framework of the nation state. Efforts to establish and promote national pharmacopoeias thus

took place at the intersection of the local and the national, the center and the periphery, “traditional knowledge” and “modern science,” and other binaries that we use to understand the past. By examining the Spanish pharmacopoeia in the eighteenth century, the origins of the Bengali pharmacopoeia in the 1840s, and the U.S. pharmacopoeia in the nineteenth century, this panel places the effort to standardize scientific knowledge about pharmaceuticals at the national level in the context of both local forms of knowledge and global flows of commerce, science, and power.

Title: Beyond the Laboratory: Animals and the Culture of Scientific Knowledge

Abstract: When one thinks of creating scientific knowledge with animal bodies, the first thought is often of laboratory experiments. However, the centuries-long history of the relationship between animals and science shows that the scientific use to which animals have been put extends well beyond the confines of the laboratory. This panel looks at places where animals and science intersect beyond a strict research setting. Investigating material from across the globe, spanning the sixteenth century to the present, our panelists show how the use of animals in the production of scientific knowledge gets at larger questions about how scientific knowledge is used, what cultural anxieties it informs, and how animals continually shape the definition of science. This panel brings together scholars across several disciplines and career stages whose work intersects at this nexus of science, animals, and culture. Allison Kavey interprets 16th century magical cosmology, clarifying the human-animal connection in occult philosophy. Julie Smith enters the 18th and 19th century world of animal autobiographies, showing how human authors looked to natural scientists to create accurate animal identities. Jeannette Vaught considers the battle over vivisection in 1920s America, showing how arguments for and against the practice depended on problematic conceptions of race and animality. Amy Nelson examines the Belyaev fox breeding experiments in Cold War Russia, exploring how biology became subject to interspecies social conditions. The panel’s chair is Robert W. Mitchell, who will also provide comment.

Title: The Biologist as Public Intellectual in the 20th Century

Abstract: This session aims to explore the circumstances surrounding the rise of several American and British biologists to the status of public intellectual in three crucial periods during the twentieth century—the years surrounding the First World War, the Second World War, and the Cold War. While recent historiography has contemplated the social role of scientists as experts and of scientific expertise in the twentieth-century, this session aims to consider the broader cultural roles played by a handful of biologists as public intellectuals. In particular, it explores the myriad strategies that biologists have taken to construct public personae that could mediate successfully between their scientific and non-scientific audiences. Judy Johns Schloegel's paper explores how William Emerson Ritter and Herbert Spencer Jennings capitalized on institutional connections during the 1910s and 1920s to establish their authority as public intellectuals. Marsha L. Richmond considers the geneticist Charlotte Auerbach and the ecologist Rachel Carson, using their lives to explore the ways in which women constructed their public scientific authority in different ways – and perhaps with different audiences in mind – than men did. David K. Hecht uses Richard Dawkins and his bestselling book The Selfish Gene to explore how one biologist used metaphors and rhetorical tropes from outside of biology as a means to enhance scientific authority. This session argues that scientific work and public engagement are contiguous rather than dichotomous aspects of these biologists' careers; both the production and the consumption of scientific knowledge are better understood with historical appreciation of this continuity.

Title: The Body as Machine

Abstract: How did modern technological advances come to shape representations of the human body? Such is the overarching theme of this panel, whose papers—ranging from the late-19th-century inventions of Serbian-American scientist Nikola Tesla to French physiologist Jules Amar’s anti-Taylorist chronophotographs, with a detour in the early world of telegraph and telephone operators—investigate through various angles. Incorporating a resolutely interdisciplinary approach and fostering cross-cultural dialogues, the papers explore a number of complementary

themes: the politicization of the body and its inscription in the broader social sphere, the fertile dialogues between art and science in an increasingly positivistic age, and the significant impact of changing media ecologies on gender identities. At a period in which everything and everyone ran the risk of becoming mechanized, Descartes's trope took on particular relevance and captured the modern imagination.

Title: Bounded Rationality and the History of Science

Abstract: Humans are no longer rational. Economic, political, and historical theories, once predicated on basic assumptions about rationality, today more often highlight the constraints on rational choices. The theory of "bounded rationality," a term coined by Herbert Simon, links work across the sciences: economists, cognitive psychologists and political scientists are busy modeling the ways in which our behavior is culturally, materially, and psychologically "bounded." Historians of science have described concepts akin to "bounded rationality" in their own ways. From studies of laboratory notebooks to the "practice-ladenness of theory," they have revealed the material roots of rarefied ideas. As participants in this general project, we would like to open up a more direct dialogue with theorists in the social and human sciences in order to historicize ideas about "bounded rationality"—both theirs and ours—and explore the promise (and pitfalls) of adapting recent work on the topic as a tool for historical research. The panel's four papers, running from 100 BCE to the 1950s, will be presented in reverse chronological order. First, Stephanie Dick will situate Simon's work on bounded rationality in broader conversations about "limitations" in mid-twentieth century mathematics and computing. Second, Henry Cowles will show how Victorian theories of "trial and error" placed physiological limits on rationality. Third, William Deringer will examine computational disagreements during the 1720 South Sea Bubble to probe the shifting bounds of "financial rationality." And fourth, Colin Webster will explore medical heuristics though examining Methodism, a first century BCE school of Greek medical thought.

Title: Bringing the "Archival Turn" to the History of Science (Noontime Roundtable)

Abstract: The history of early modern science is increasingly being told in terms of a flood of paper, an "information overload." Collecting, managing, and preserving this paper was central to the production of scientific knowledge. Individuals and institutions assembled collections of documents now considered relevant to the history of science, preserving everything from correspondence to weather diaries to account books to ship pilots' logs. They built these collections on a belief that they were a path to universal knowledge. At the same time, historical scholarship more broadly has taken an "archival turn," with a wave of recent books and conferences exploring histories of archives. These studies, which have focused especially on archives' roles in state formation and imperial and post-imperial governance, reveal archives not only as sites for researching the history of political and cultural power but also as instruments through which that power was wielded. Here, too, the utility of the archive rested on its promise of universal knowledge. This noontime roundtable will interrogate these bodies of scholarship against each other. How have archives served as instruments of scientific practice? How do their histories shape and constrain the stories historians write from them? In what ways have early modern practices set the pattern for the collection of documents into the present? How is digitization of archives transforming historical scholarship? In examining these questions, we will see more clearly the histories of tangled relationships between science and state; material practices and public knowledge; secrecy and openness; and science and history.

Title: Capturing Distance, Documenting Travel: Film, Photography, and Expeditionary Science

Abstract: The turn of the 20th century witnessed the United States emerge as one of the world's most commanding economic, political, and military powers. Not coincidentally, the same period also saw its scientific community take center stage. The threefold connection between America's rise in political, economic, and epistemic power is perhaps best illustrated by the ambitious, well capitalized, and widely publicized expeditions that its research institutions sent to far-flung destinations all over the world. Of course, exploratory missions have been closely bound up with the modern state's imperial ambitions since the grand voyages of discovery of the 17th and 18th centuries. However, this panel will use the medium of still and motion picture photography to ask what was

distinctive about American museum, university, and industry sponsored expeditions at the turn of the 20th century. This panel brings together three papers that critically interrogate the use of photographic and filmic evidence in early 20th century American expeditionary science. It is striking that although each of the three expeditions that we discuss had different aims, represented different scientific sub-fields, and were sent to different geographic locations, all made extensive use of still and motion picture photography. Why was this so, and what does the widespread use of these representational technologies tell us about the nature of expeditionary science at the time? Moreover, how can we read this photographic record as documentary evidence to learn more about these expeditions, as well as the peoples and places with which they came into contact?

Title: "The Center of Gravity of Mathematics Has Moved More Definitely toward America": The Mathematical Sciences in America, 1930-1950

Abstract: In 1938, the American research endeavor in the mathematical sciences was, by at least one measure, fifty years old; the American Mathematical Society (AMS) had been founded in 1888. By the time of that semicentennial, the mathematical sciences in the United States—and especially pure mathematics—were on the verge of international ascendancy, a fact appreciated by the community's leaders. As AMS Secretary and Brown University Professor Roland Richardson put it, "[t]he center of gravity of mathematics has moved more definitely toward America." This session will explore the notion of a shifting "center of gravity" in at least two ways: the rising prominence of the research communities of American mathematical scientists internationally and the physical movement to the United States of three prominent emigrés: mathematical physicist Richard Courant, algebraist Emil Artin, and statistician Abraham Wald. Those emigrés, trained in a Europe that had been the mathematical standard-bearer, entered a highly developed mathematical environment in which they could immediately participate at the same high level they had experienced in Europe.

Title: Contingency in Early Modern Science and Natural Philosophy

Abstract: This session explores the idea of contingency in early modern science—its epistemological and ontological ramifications. In their efforts to specify mechanistic and mathematical laws governing nature, early modern scientists also addressed themselves to the apparent lack of absolute regularity among natural phenomena. Following Aristotle, Scholastic and Medieval natural philosophers had characterized nature (and in particular the sublunary world) as the domain of the "for the most part" rather than that of absolute necessity. Contingency, in this way, was seen as an intrinsic trait of nature. However, over the course of the sixteenth and seventeenth centuries, the rise of mechanism, experimental practice, new instruments of observation and measurement, as well as the application of mathematical heuristics to the study of nature challenged the traditional ways of understanding the predictability and unpredictability of natural phenomena. Contingency increasingly—but not exclusively—took on an epistemological rather than an ontological cast. The unpredictability or apparent irregularity of natural phenomena prompted critical reflection upon the limit of human ability to find comprehensive causal explanations—or, in other words, to reach a full understanding of the necessary causal concatenation determining each and every natural phenomenon. Our papers focus on this transformation in the notion of contingency in early modern science—also questioning to some extent its apparent univocity. Collectively, we explore the ontological and epistemological attendant shifts brought by this fundamental transformation.

Title: Cultures of Work in the Human and Field Sciences

Abstract: How has the structure of scientific work around the world shaped discoveries about the natural world and human history? By considering the concept of work, outside of the controlled setting of the laboratory, this panel will bring recent scholarship on the materials and practices of science into the field and the asylum (e.g., Kohler 2002; Landecker 2007; Tilley 2012; Porter 2012). It asks how work has been defined historically in fields that range from the social to the biological sciences, and from Europe to Asia, Latin America, and the Middle East. The papers that make up this panel will look at multiple contexts of work and workers in the formation of anthropology,

archaeology, psychiatry, and biology in the late nineteenth and early twentieth century. How do field researchers and laborers, or the asylum psychiatrist and his patients, define work and its spaces through the material and social interactions of scientific practice? What can we learn about the development of scientific thought by studying fieldwork, as a division of labor, in different times and places? How are specific arrangements of instruments and operations assembled into various forms of work? By examining the concept of work from different angles of gender, emotion, and globalization, this panel will explore how the work practices and materials of the scientist, the lay-person, the local expert, and the laborer all participate in defining what spaces are considered places of scientific investigation.

Title: Decisive and Divisive Brains: Making Identity Intelligible

Abstract: Brain research has always included at least two types of brains: those that are researched, and those that are researching. This panel will offer insight into both. Five case studies from the mid-19th to the early 21st century will illuminate how human identity concepts interacted with knowledge about brain matter and brain function. The papers will illustrate the ways in which experimental findings and theoretical concepts about brains were converted into socially relevant knowledge about selfhood. In this connection, the panel will offer an analysis of various practical and rhetorical tools for the acquisition and dissemination of identity concepts. We will consider the polarities that researchers employed to facilitate the practical assessment as well as the theoretical formulation of what human identity is—in both a descriptive and a normative sense. Furthermore, the papers will address different historical approaches to deal with the deviant; for instance, separation, enhancement, or substitution. Attention will also be given to how external conditions shape scientific research questions and limit the sets of answers that seem appropriate: In what instances was brain research driven by economic interests, policy concerns, or social exigencies? How much transformation did research findings undergo before they were adopted by a broader public? Were new identity concepts first uttered in- or outside of the laboratory? How, if at all, were seemingly contradictory concepts in the scientific and non-scientific realm reconciled?

Title: Documenting and Defining Human Subjects: Historical Reflections on the Questionnaire

Abstract: Questionnaires both interrogate and define human subjects in fields as diverse as public health, ethnography, dialectology, and behavioral economics. As instruments of scientific practice, questionnaires embody distinct epistemological assumptions about how social knowledge is best generated while, in their materiality, extending the social, geographic, and institutional reach of the human sciences. Whereas research protocols endeavor to discipline the observer, questionnaires shift our attention to that which is observed--quite often, the respondent filling in blanks or choosing items from a picklist. Analyzing this unique form of scientific inquiry, our papers engage the following core questions: (a) What are the main turning points in the history of questionnaires? How are these turning points marked terminologically? To what extent were these changes driven by developments in disciplinary hierarchies, research practices, technology, and theory (e.g. the emergence of statistical knowledge)? (b) How, if at all, do questionnaires differ historically from competing practices such as ‘protocols’, ‘practicing instructions’, ‘guides’ etc.? How do such alternative modes of enquiry highlight embedded claims to the objectivity and self-reflexivity of the questionnaire? (c) How have the style, content, and materiality (size, structure, availability, distribution, etc.) of questionnaires helped to delimit a field of observation? How have such fields, in turn, shaped how subjects are known in the human sciences? Pursuing these issues through our case studies, we collectively examine the ways in which questionnaires have contributed to both the definition of human subjectivity and the subjects of human research over time.

Title: Early Modern Atlantic Scientific Discourses

Abstract: The conceptual incorporation of early Americas' natural world into Western natural philosophy, along with the empirical verification of classical knowledge through Renaissance natural history, outlines the beginnings of natural science. This intellectual process cannot be understood apart from the European colonization of the

Americas. Recent works by historians of science such as Daniela Bleichmar, Harold Cook, Maria Portuondo, Víctor Navarro Brotóns, Marcy Norton, José Pardo Tomás or Paula Findlen have established that the European study of Early Americas' geography, nature and cultures transformed the Western conception of reality. However, the material and intellectual processes that underlie the cultural and scientific assimilation of indigenous American and early modern European natural knowledge remain understudied. Through the analysis of the cross-cultural processes of recognition, methodological aspects, building knowledge and joint adaptation, this session aims to conceptualize early modern transatlantic empirically based discourses and practices. We aim to explore: Early Americas' indigenous agency and roles in the development of early modern natural science and early modern medicine; the transatlantic and cross-cultural emergence of a distinctive empirical culture; and the influence of Early Americas historiography in the empirical and scientific discourses and practices that gradually transformed medieval natural philosophy into early modern science.

Title: Early Modern Scientific Networks

Abstract: In the last decades, historians have argued that modern science emerged as the collaborative efforts of humanist scholars, erudite physicians, antiquaries and natural philosophers across Europe, who formed an intellectual network, the international Republic of Letters, maintained by the free or reciprocal gift exchange of ideas. In recent years, scholars have expanded this insight, giving it a global reach and one that traversed boundaries of class and gender and race. They have emphasized how Muslim ulamas, English “mechanicks,” aristocratic women, artisans, booksellers, and slaves transported through the Atlantic participated in the circulation of knowledge. Our panel joins this scholarship by emphasizing the complex, competitive, and oftentimes commercial nature of such mixed networks. Such an approach offers a contrast to the earlier literature on the Republic of Letters, and offers the opportunity to develop a new vocabulary for analyzing how knowledge, commodities and people circulated within the early modern world. The four talks reveal the scientific orientation of Italian theatrical networks, the commercial bent of German pharmaceutical networks, the colonial aspirations of Michel Adanson’s expeditions to Senegal, and argue that even the intellectuals of the Republic of Letters considered themselves as the militant soldiers of an imperial army, fighting the barbarous savages of unreason. The speakers form a highly diverse group. They represent three nationalities, they include both junior and senior scholars in the discipline, and they are from four different universities on the East and West Coast.

Title: Economies of Nature: Accounting for Silk, Coal and Filth

Abstract: The rise of modern accounting, comprising developing practices of value calculation, was increasingly crucial to natural scientists, financiers and bureaucrats from the seventeenth century onward. This session explores the close connections between states, markets and accounting practices from the age of the Enlightenment to the late Industrial Revolution. Our three papers consider the wide variety of ways in which experts have generated accounts of stocks, flows and profits. Joppe van Driel investigates the case of waste circulation and chemical expertise in the Dutch Enlightenment. Fredrik Albritton Jonsson examines competing accounts of the British coal reserves in the early nineteenth century. Emily Pawley shows how antebellum science validated the calculations of silk speculators during the 1838-39 American “Mulberry Bubble.”

Title: Einstein and the Relation between Physics and Mathematics

Abstract: In this session the role of mathematics in Einstein’s practice of theoretical physics is examined. Mathematical innovation was essential for the transition from classical to modern physics. Einstein himself reflected on the relation of mathematics and physics on several occasions. These reflections have been important for the understanding of theoretical physics ever since, but they have been read mostly ignoring their historical context. The session will attempt to elucidate this context. The four talks in the session explore this theme in different ways. Building on his work on Einstein’s use of different traditions in 19th-century geometry in the development of general relativity, Norton argues that Einstein remained much more comfortable with these 19th-century branches of

mathematics than with the new 20th-century branches central to the development of quantum mechanics. Renn and Janssen revisit the distinction between the physical and the mathematical strategy used in Einstein's search for the field equations of general relativity. They examine a key text for understanding the physical strategy, Einstein's lecture on the problem of gravity in Vienna in 1913. Expanding on his book, Einstein's Unification, Van Dongen traces Einstein's move from the physical to the mathematical strategy in his work on unified field theory. Finally, expanding on his contribution to The Cambridge Companion to Einstein, Lehner argues that to understand Einstein's opposition to quantum mechanics we carefully need to examine Einstein's views on how the mathematical formalism of a theory ought to represent both the phenomena and the reality behind them.

Title: Euler: Mathematical Genius in the Enlightenment

Abstract: This session would examine selected principal contributions of Leonhard Euler (1707 - 1783) to pure and applied mathematics. He worked at the Berlin and the Petersburg Imperial Academy of Sciences, as well as competing for Paris Academy prizes. Along with Archimedes, Newton, and Gauss, Euler is one of the greatest mathematicians and theoretical physicists in history. Building chiefly upon the more than 80 large volumes of Euler's Opera omnia, now nearing completion that includes his massive correspondence, Professor Bradley opens the session with Euler's golden Berlin period as an able administrator and prolific author especially in its Memoires. He focuses on the center of Euler's research with hundreds of discoveries in differential calculus. He also brings out Euler's fundamental advances in mechanics, astronomy, optics, electricity, and magnetism. Professor Klyve examines the original edition of Euler's popular Letters to a German Princess (3 volumes, 1768 - 1772) in French before editors widely modified them as a case in the relation between science and religion in the late Enlightenment. Professor Calinger investigates highlights after Euler returned to St. Petersburg in 1766. He presents Euler as the principal creator of the mathematical language of the modern mathematical sciences and argues that Euler, not Lagrange, invented the analytical form of the calculus of variations. He describes Euler's most precise lunar theory of the century and corrects accounts of relations with Diderot. This session precedes Princeton University Press's publication in 2015 of the first comprehensive biography of Euler.

Title: Everything You Wanted to Know About Negotiating a Job Offer, but Were Afraid to Ask

Abstract: Getting that coveted job offer is not the end of your job search - now you are faced with how to negotiate for the most advantageous contract. Thanks to recent press on academic job negotiations gone wrong there is even more concern than usual about this topic. What to ask for, how to ask for it, and what to avoid asking make this a complicated and often mysterious process, but one you neglect at your own risk. This workshop will be led by a representative of the Higher Education Recruitment Consortium who is also an expert on self-promotion and negotiation, specifically as they relate to race and gender in STEM and higher education fields.

Title: Evidence in Mathematical Understanding

Abstract: Mathematical truth is often understood in terms of the self-evidence of its foundations and the structured certainty of the formal systems in which it is presented. The deeply personal experience of mathematical persuasion and conviction derives from and underwrites the seemingly abstract structure of mathematical knowledge. Our studies of mathematics in the eighteenth, nineteenth, and twentieth centuries examine the question of mathematical "evidence," the personally experienced quality that makes mathematical truths look impersonally true, and that informs mathematicians' disciplinary and technical judgments. With the term evidence, we draw attention not only to the centrality of persuasion and judgment in mathematical thinking, but also the immediate and sensual quality of many mathematical objects, relations, and understandings, in contradistinction to the 'deep' structure often emphasized. That is, we interrogate both the "self" and the "evidence" in the history of mathematical self-evidence and understanding. We aim both to interrogate the often-overlooked materiality of mathematical ideas and debates and to consider that materiality in the context of elements such as imagination, stipulation, credit, and intellectual consent often considered apart from it.

Title: Experimental Decisions: Radiation and Genetics in Japan

Abstract: This panel examines scientific developments within Japan during the long twentieth century in two areas of experimental technology and science: radiation and genetics. Japanese scientists shared pragmatic and ideological concerns in these arenas. The intertwined histories of radiation and genetics have received great attention in the aftermath of the nuclear bombings of Nagasaki and Hiroshima, as well as in recent times following the nuclear power plant disaster in Fukushima. This panel echoes those concerns, but primarily seeks to advance a broader historical analysis that allows for the investigation of questions about continuity and rupture with respect to science in Japanese societies. Close historical examinations of the continuity of Japanese scientific activities flanking WWII are crucial to understanding why or how certain intellectual and ideological positions within genetics had developed in Japan, or why attitudes toward radiation in Japan may have been more ambivalent than previously assumed. Intellectual and experimental negotiations that sought to navigate the uncertain or new sciences of the time, in fact, paralleled the negotiations that scientists made amongst themselves as they anticipated how different social groups would perceive Japan's domestic achievements and their relation to a larger world. In the arenas of genetic science and radiation, scientists, technologists, medical doctors, erstwhile statesmen, and ordinary people confronted distinct choices about various technical and scientific issues. Their decisions steered Japan through its postwar navigation of the social and scientific roles of radiation, and in the controversial work of maintaining the credibility of a scientific discipline within a democratizing society.

Title: Fish, Fathoms, and Fair Winds: Contextualizing Marine Science within Changing Scientific Institutions, Cultures, and Communities, 1840-1940

Abstract: This panel examines topics in marine science, placing the work of the United States Naval Observatory, Coast Survey, and Bureau of Fisheries, among other institutions, in the context of larger communities and events that at times constrained, expanded, and influenced scientific work at sea. Jason Smith considers the fruitful and fraught intersection of military, scientific, and maritime worlds in the antebellum work of Lieutenant Matthew Fontaine Maury. Rodolfo John Alaniz examines deep sea sounding and the effect of the American Civil War on a transatlantic community of zoologists and geologists, including the little-known Louis François de Pourtalès, as they participated in “the biotic debate,” a contemporary controversy defined by access to deep sea sediment samples. Matthew McKenzie examines the work of Henry Bryant Bigelow and William C. Herrington, placing fisheries science and E.S. Russell’s “Theory of Fishing” within the racial, ethnic, political, and ideological contexts of the New England fisheries. Ultimately, these papers show that marine science existed in a larger transatlantic world of competing and collaborative interests that affected its nature and outcomes as well as the communities, industries, and institutions it served. Finally, the origins and outcomes of this work proceeded from the marine environment itself, which, in the century between 1840 and 1940, continued to present unique challenges to those seeking to understand the ocean.

Title: The Greater and Lesser Circulation of Scientific Concepts in Early Modern East Asia: Aristotle, Newton, and the New Lives of the Notion of Qi (Ch’i)

Abstract: No other concept played a greater role in shaping the intellectual and cultural landscapes of pre-modern East Asia than the notion of Qi (Ch’i). According to this notion, there existed an all-pervasive and self-propelling cosmic energy, Qi, which originated and constituted all modalities of existence, from inanimate objects to human consciousness to spiritual beings. Through the systematic elaboration by Neo-Confucian philosophers of the Song dynasty, this notion of Qi and the associated concepts of Yin, Yang and the Five Phases came to serve as the overarching conceptual apparatus with which to explain all phenomena in Heaven, on Earth, within the human realms. Although originated in China, this notion had long been entrenched in Korea and Japan and gave a distinct form to the shared dimension of East Asian cultures and world views in the pre-modern era. This panel aims at exploring the shared histories and divergent paths of scientific development in East Asia during the early modern era

through a unique angle: it offers three micro-histories that testified to how this Qi-centered world view came to be expanded and transformed due to encounters first with the Aristotelian theory of four elements introduced by the Jesuit missionaries and then with versions of Newtonian physics arriving in the eighteenth and nineteenth centuries. As a whole, the panel explores the new dynamic of knowledge-making in an increasingly internationalized environment, as East Asian scholars were connected through an ever expanding circuit of exchange that linked them across the region and the globe.

Title: Historians of Science Watching COSMOS: Interpretive Challenges and Teaching Opportunities

Abstract: In recent months, the historical tales of Neil de Grassi Tyson's new COSMOS series have inspired some fascinating discussions amongst historians of science. The first episode's dramatic portrayal of Giardano Bruno, for example, was followed by insightful commentary on the perils and ahistorical nature of such tales. This commentary in turn inspired interesting discussions of the pedagogical role of historians of science in general. Taking media in all its various forms as potential venues for the dissemination and discussion of the historical insights of our fields, the Education Committee would like to propose a roundtable session during which 6-7 scholars reflect on the issues raised by COSMOS and responses to it. In general, the roundtable will examine how we, as scholars, can turn the COSMOS series - old and new - into useful 'teaching moments' both for our discipline, students at all stages (K-12 and in our own classrooms), and for the broader public. Scholars have been asked to participate who have either commented on the recent series, have studied the original series or used it in the classroom, or are experts in the field of science communication in general. We envision each participant speaking for 5 minutes to the themes of interest to them, and then the chair opening the room up to discussion with both audience and roundtable participants. As preparation for the roundtable, an electronic and paper 'postcard' will be produced with links to relevant commentary on the series.

Title: Historical Tracers and the Historiography of Science

Abstract: Historians of science have studied diverse cases in which scientists have generated knowledge by means of "tracers": objects and practices that make invisible entities and ephemeral phenomena visible and accessible to scientific study. Sometimes, historians have done so by following those very "tracers" (or their traces in the archive) to uncover otherwise hidden historical relationships and patterns. In her recent book "Life Atomic", Angela Creager has referred to such objects - in her case, radioisotopes - as "historical tracers." This session will bring together four historians engaged in such projects, with the aim of determining common features, opportunities, and pitfalls that this historiographic situation presents. Papers will address systematic chemical names, human movement notation, DNA databases, and digital surveillance. How does our historiographic use of tracers shape our accounts of their historical use? What special opportunities for critique are offered by turning actors' own methods upon their tracing practices? What are the ethical stakes of such an approach? Participants in the session will seek to begin to address these questions and raise others through their papers and ample discussion.

Title: History of Interdisciplinarity: What We Do and Do Not Know - and Why It Matters

Abstract: For decades, interdisciplinarity has been a buzz-word. Policy makers have claimed that many of the problems that face us today are interdisciplinary and can only be addressed by scientists collaborating across disciplinary boundaries. New interdisciplinary research areas and educational programs have been created. Institutions have been restructured to better facilitate interdisciplinary activities. At the same time, it is far from clear what interdisciplinary science is and how it has developed historically. This session will start from an overview of how disciplines and interdisciplinarity has been studied by historians, sociologists and philosophers of science over the last decades and then present an analysis of how 20th century disciplines due to the complexity of scientific knowledge and activity differs from the disciplinary format of the 19th century (Andersen, Markovich & Shinn). Next, it address the diversity of interdisciplinarity through talks on interdisciplinarity in applied research (Nielsen)

and interdisciplinarity in the mathematization of the natural sciences (Sørensen), and it discusses the interdisciplinary collaboration between scientists and scholars in history and philosophy of science in the study of contemporary science (Bursten). The session will close with a reflection on the role of (inter)disciplinarity in the historiography of contemporary science. The session will be coordinated with a session on Philosophy of Interdisciplinarity accepted for the PSA program. The two sessions will supplement each other and enable scholars interested in interdisciplinarity to explore both historical and philosophical issues, but at the same time each session is an integrated whole and does not require participation in both.

Title: History of the History of Science in the U.S., 1940-1976—The Golden Age?

Abstract: Between 1945 and 1970 the history of science grew from an arcane specialty to an academic field in the U.S. This session presents three papers on this theme. The first examines the correspondence of George Sarton and Alexandre Koyré, the French philosopher whose work and numerous visits to the U.S. in the 1940s through 1964, influenced a generation of scholars of medieval and early modern science. The second paper presents evidence that though Thomas S. Kuhn left Harvard with his PhD in 1953, there was an often raised possibility of his return to the faculty of Harvard's new Department of the History of Science, created in 1966. Though this never happened he was involved in the evaluation and selection of others who were, including Barbara Gutmann Rosenkrantz. Then the third paper is an analysis of the all-too-short history of the Department of History of Science and Medicine at Yale University. It started with great acclaim in 1960, building upon the university's existing strength in the history of medicine at its medical school and library, and grew rapidly especially in the direction of Otto Neugebauer's "exact science in antiquity." Unfortunately the department encountered severe financial retrenchment after 1970 and was terminated in 1976, though the subject persists there to the present.

Title: The History of the Humanities – A Challenge to the History of Science?

Abstract: During the last three decades, the scope of the history of science has undergone a tremendous broadening: historians of science have looked at the infrastructures, cultural settings and social interactions that shape the sciences, they have related the sciences to the arts, crafts, scientific education and popular cultures of knowledge, and eventually, they have pointed at the role that methods in disciplines traditionally associated with the humanities – from philology to art history – have played in the sciences. Nevertheless, there is still no common ground for a comparative study of the histories of the sciences and the humanities. When asking about the commonalities and differences between these histories, we seem to face a last resort of the two cultures into which academic scholarship was divided in the past century. This panel, chaired by Dagmar Schäfer, wants to confront the persisting divide: in co-authored papers we challenge the specificity of the objects in the histories of the sciences and humanities, suggesting instead to tear down this last barrier between the two worlds: Rens Bod and Johanna Sprondel trace the history of empirical, pattern-oriented methods in the humanities and sciences and up-until the recent digital turn. Jimena Canales and Markus Krajewski compare concepts of accuracy, precision and exactitude in the humanities and the sciences. Soraya de Chadarevian and Julia Kursell discuss shared methods in the humanities and the life sciences and their impact on concepts of history. A commentary will be provided by Ingrid Rowland.

Title: The "Inner Life" in French Psycho-Physiology from the Late Enlightenment to the Late Nineteenth Century

Abstract: Few themes have commanded greater attention in recent years from students of the transition from Enlightenment to nineteenth-century science than the manifold meanings attached to the term "sensibility" and its implications for medicine, physiology, philosophy, aesthetics, pedagogy, and a host of other fields of inquiry. In ways that remain little understood, this period's focus on sensibility and its cognates "sense" and "sensation" (to name only these) has encouraged the development of new, frequently overlapping domains of historical investigation, including the broad-gauge "history of the body" and the more specialized "history of emotions" and "history of the senses." While scholarship to date has tended to privilege the workings of the external senses (with

vision occupying its traditional pride of place), more recently processes and phenomena of the "inner life" have come to the fore. This panel is situated within this emergent historiography of the sciences of the inner life. Focused especially on French scientific, philosophical, medical, and aesthetic texts from the late Enlightenment to the late nineteenth century, the four panelists show how central ideas of the inner life were to debates on the boundaries between body and mind, need and desire, animal and human, instinctual and willed, in sum, to some of the most consequential learned controversies of these years.

Title: Innovations in Animal Husbandry and Livestock Breeding and the Formation of New Forms of Expertise

Abstract: Historians increasingly pay attention to the role of animals in the production of knowledge. Recently this trend has spread to include the history of livestock animals. Livestock has always occupied a specific place in society, and the history of animal husbandry evolved at the intersection of the history of economics, politics, agriculture, science and culture. Gaining knowledge and implementing technological change within the world of animal husbandry have been complex processes that defied simple divisions into top-down or bottom-up processes. Major innovations, like the introduction of AI, can be said to have involved the transformation of a system of breeding that was rooted in economic, technical, cultural and normative convictions, and that involved a complex interplay between multiple groups of actors. In this panel we would like to address the problem of accurately describing the process of innovation by focusing on the role of the expert. Who is considered an expert and why? Which new kinds of expertise are developed during the interactions between the different stakeholders, and how do new experts become recognized as such? What happens to older kinds of expertise in the process? What were the primary reasons of researchers to gain expertise regarding livestock in the first place? We suspect that innovations and new forms of expertise in animal husbandry and livestock breeding are constructed simultaneously and in close interaction, and that a focus on the fate of different forms of expertise can help us better to understand how major transformations in these fields come about.

Title: The Institution as Laboratory: Captive Bodies and the Production of Scientific Knowledge

Abstract: How does the site of knowledge production influence the development of scientific expertise? What kinds of bodies – and spaces – are seen as most useful to scientific research? Does the location of these bodies within institutional spaces affect how the knowledge produced is interpreted historically? This panel revisits institutional spaces, such as the prison, the asylum, and the hospital, and reframes them as laboratories, sites for the production of scientific knowledge. The panel also examines the human occupants of such spaces as productive bodies, exploring the power dynamics inherent to the use of such bodies as both objects and subjects of research by scientific and medical professionals. The five papers which comprise this panel explore five different institutional spaces – the prison, the hospital, the madhouse, the library, and institutions for the developmentally disabled – at different historical moments in order to consider the uses these sites have served in the production of scientific knowledge. By addressing these different kinds of sites, scientific practices, and historical moments, this panel seeks to trouble the boundaries of the "laboratory" in the history of science and medicine and to explore the various uses of institutionalized individuals as both the objects and subjects of scientific research.

Title: The Latter-Day Lyceum: Pushing the Boundaries of Catholic Aristotelianism, 1500-1750

Abstract: A generation ago, Charles B. Schmitt suggested that Aristotelianism should be understood as a plurality of doctrines rather than as a monolithic tradition. Building on the foundations laid by Schmitt and other historians of medieval and early modern science, scholars have since uncovered a multitude of Aristotelian visages. Much work remains to be done, however, to understand the complex dynamics that existed between theology and Peripatetic philosophies, especially within Catholicism where both the clergy and lay members of the Church commonly used Aristotle as a fulcrum for criticism and a vector of innovation. Controversies raging in Italian, Spanish, and French settings show that Aristotelians and advocates of the "new science" rarely formed discrete camps, and that, taken on

their own terms, Catholic Aristotelians could be novatores. The diversity, flexibility, audacity, and occasional heterodoxy of scholastics, many struggling to reconcile their familiar framework with new discoveries and new institutions, all continue to merit attention as crucial threads in scientific debate and development. This session contributes to this scholarly effort by discussing Fortunio Liceti's (1577-1657) defense of Aristotle against contemporary accusations of impiety (Eva Del Soldato); the debate over Aristotle's theory of dreams in sixteenth- and seventeenth-century Spain and Italy (Craig Martin); the Jesuit "war on the occult" in the context of the post-Tridentine reform of scholastic ontology (Mark Waddell); and the mechanico-spiritual disaster theory of Louis-Bertrand Castel, SJ. (1688-1757) in early Enlightenment France (Jean-Olivier Richard).

Title: Making Data and Making Sense of Data: Histories of Information in Public Health Science and Practice

Abstract: The process of making of data into information, when approached either materially or epistemically, is a topic of increasing interest to historians of science. Public health is a particularly rich site to explore this topic, not only because of the centrality of large-scale data to this endeavor, but also because the creation, collection, and analysis of data is designed to inform interventions in the world. The four papers on this panel examine how data is made and made sense of in public health science and practice. Angie Boyce examines the recent history of public health efforts to make the genomic "data flood" epidemiologically relevant and navigate an epistemic and infrastructural shift from molecular to genomic epidemiology within microbial disease surveillance. Emily Harrison locates her historical analysis in specific sites of global intervention on infant mortality in the second half of the twentieth century, using the infant mortality rate to examine how local interactions contributed to emerging sciences of human development. Aaron Mauck describes how bioinformatic methods entered public health research, reconstructing sites of data collection and redefining the relevant populations for public health research. Laura Senier examines how a state health agency has integrated genomics into existing surveillance, workforce development, and policy initiatives, with special attention to how policymakers mobilize internal organizational resources to respond to opportunities in the organizational field.

Title: Mathematical Laboratory / Paper Physics: Concepts, Pedagogy, and Methods of Mathematical Physics

Abstract: Although physical sciences have been mathematized since the very beginning of the scientific revolution, mathematical physics as such has remained surprisingly difficult to describe. As a disciplinary field, it is vaguely defined and crosses multiple subject matters. Celestial mechanics, optics, thermodynamics, electromagnetism, and, more recently, chaos theory and string theory have all been regarded as natural topics for mathematicians as well as for physicists. Over the centuries, mathematical physics has maintained a fundamental duality. On the one side, it has unceasingly produced scores of important mathematical problems and has worked as a conceptual laboratory to test the fruitfulness of many formal techniques. On the other, it has embodied the dream of unveiling the innermost secrets of nature with the only help of pen and paper. Scientists such as Boltzmann, Poincaré, Einstein, Feynman, to mention only a few, have often been taken as champions of this ideal. Thus, mathematical physics appears to be a changing sub-culture kept together largely by the conviction that mathematics is more than a useful tool and physics more than a set of intriguing puzzles. This session intends to explore the intricate relation between mathematics and physics at multiple levels: epistemological, disciplinary, methodological, and pedagogical. In particular, the proposed papers focus upon the role of mathematical physics (1) in originating new concepts and methods both in mathematics and physics, (2) in serving as a platform for fruitful interaction between various scientific cultures across geographical borders, and (3) in providing innovative interdisciplinary forms of training.

Title: Mathematics and Mechanics

Abstract: This panel of four papers investigates how mathematics was related to mechanics in different historical periods. Each paper presents an interpretation of the role of mathematics in mechanics for the particular scientist or

the time period involved. Topics are 1) the complementarity of mathematical and mechanical methods in the Ptolemaic celestial mechanics of Peurbach's Theoricae, 2) the relation of Newton's physics and his philosophy of mathematics, 3) mathematics in ancient mechanics before Archimedes, and 4) the ontologizing of activity as a feature of post-Newtonian analytic mechanics. The session spotlights how mathematical notions shaped mechanics and its concepts but also shows that mechanical concerns sometimes influenced formulations in mathematics. Consideration of the interaction of mathematics and mechanics in these particular cases provides diverse material for discussing what mechanics is in its history and the nature of the involvement of mathematics in mechanics. There are numerous points of contact among the papers.

Title: Measuring People: Anthropometry as Practice, 1890-1950

Abstract: This panel focuses on anthropometry as technique of knowledge production. In particular, we aim to shift the focus away from the theories and discourses of anthropometry to its practicalities, thus examining precisely how anthropometric knowledge was produced, where, and by whom. While histories of anthropometry often point out its declining popularity after the 1910s, all four papers, which examine archival sources and non-scientific publications, challenge this assumption. Alberto Ortiz concentrates on anthropometry as penitentiary science in Puerto Rico's Insular Penitentiary (1930s-1950s). Focusing on inmate-expert interaction, Ortiz investigates the shared production of anthropometric knowledge. Saskia Bultman examines the Dutch state reformatory for girls (1905-1952), focusing on the manifold practices through which anthropometric knowledge about these girls was produced and processed. Geertje Mak compares the measurement practices used in three different locations: Dutch police stations (1896), a colonial expedition to Dutch New Guinea (1909), and the Dutch girls' reformatory discussed by Bultman. Both Mak and Bultman highlight the abundance of data produced in anthropometric encounters, and focus on the problems and non/uses of this abundance for individuation and categorization. Ry Marcattilio-McCracken shows anthropometry at work outside of scientific and state-run initiatives. Examining the book Art and Human Genetics: How to Choose the Right Mate for You (1928, 1952) by artist Corydon Snyder, Marcattilio-McCracken demonstrates the long-lasting popularity of anthropometry in the public domain. Through this panel, we hope to draw attention to anthropometry as a multiform, often state-supported, practice, operating in diverse locations with diverse aims until at least the mid-twentieth century.

Title: Modern Analytics Applied to the Past: New Perspectives on Pre-Modern Science and Medicine

Abstract: For historians of early science and medicine, there has never been a better time to engage with medieval science. The digitization of manuscripts and the production of new editions and translations has made unprecedented quantities of primary source material available to international readership. Scientific and archaeological evidence for the spread of ancient epidemics has opened up new lines of enquiry, while innovative methodologies have allowed scholars to reconstruct instruments, recreate practices, and decode recipes. Recent trends in the historiography of science have helped resituate medieval science and medicine within a global context. In this session, we will showcase some of the rich historiographical and methodological approaches now available to historians of science and medicine. Four papers aim to shed new light on medieval objects, images, and practices; on texts in Arabic, Latin, and vernacular languages; and on sites from Europe to the Near East and beyond. In the process, we pose a disciplinary question – how did 'science' relate to 'medicine' in the Middle Ages – and how has this relationship shaped modern scholarly approaches to each?

Title: Nature in Numbers: Histories of Data in the Geosciences

Abstract: The panel is focused on the politics, practices and frictions that arise when data are analyzed, handled, and put to (apparently) better, or even best, use. The proposed panel will focus on the question of data-use by considering (1) the discussions over what should be regarded as "good" data in the 19th century and how it eventually resulted in a reduced diversity of climatological evidence (Lehmann); (2) the Cold War politics behind

the practices of handling the geophysical data and the role of data archives in enabling this politics, in the period from the 1950s through the 1970s (Aronova); (3) “data sonification” as a way to develop new visions of analyzing scientific data (Volmar); and (4) by assessing the cost-benefit arguments advanced by the government working groups to justify the design of service-oriented climate products and their role in improving economic resilience to climate variability in the 1970s (Janković). The purpose of this panel is to provide a much-needed comparative dimension to our understanding of the arguments, practices, and politics of data-use, data handling and data analysis, and generate new reflection on how to assess its legacy.

Title: Number and Narratives: New Approaches to the History of the Mathematical Sciences

Abstract: This session explores the role of narrative in the history of mathematics. Rejecting the assumption that mathematics simply serves as a useful tool for quantification and value-neutral assessment, this session will reexamine mathematics in history and history in mathematics. These papers, diverse in time and in place, consider narratives from the 17th century to the present that cross national borders and deal with mathematics’s diverse applications to—and interactions with—medicine, politics, economics, and education. This session shows the profitable ways mathematics can be recommends with narratives of worth, value, power, and causation. This session analyzes how and why these mathematical narratives have historically been constructed, and uses these narratives to explore new frameworks for understanding the history of mathematics more generally.

Title: The Ontological Turn: Ian Hacking and the History of Science

Abstract: What is there? What *was* there? These are questions of ontology, a field of special interest to those who study the past and the people and things that made it up. Over the past five years, scholars from a remarkable range of fields have begun a set of useful, if acrimonious, debates over ontology. Scholars are wondering, in new ways, about the sorts of things that existed in our actors’ worlds and whether those things were as flexible as language or as solid as rocks—or both. As historians of science, we ask about the material and linguistic reality of entities from gravity to ghosts, and ask how our own work is implicated in the historical processes that constitute those realities. This forum uses the work of Ian Hacking to consider how scholars have understood objects, both conceptual and material, in the history of science. It engages recent work on what has been called “the ontological turn”—scholarship that both applies and criticizes work in ontology. Hacking's “historical ontology” has proven a fruitful framework for opening a range of questions posed in relation to this ontological turn, such as: What are the limits of contingency? Can anything be an agent? What happens when people’s worlds conflict or contradict? Thus, this forum will take Hacking as a starting point to spur discussion about “the ontological turn” and to invite conversation among historians and philosophers of science on the occasion of our annual meetings.

Title: Paracelsus and his Readers: Alchemy, Gender Identity, and Imagination

Abstract: The large outlines of Paracelsus’ legacy for chemical medicine and Pietist religion are well drawn, but much remains to be understood about the man himself, the contours of his intellect, and how his readers interpreted his writings and used them to further their own ideas and practices. The four papers in this session examine neglected aspects of Paracelsus’ thought and interpretations that need to be revised, beginning with an examination of Paracelsus as a practicing alchemist and his interpretation by the two prominent first generation Paracelsians and culminating with a reexamination of the role of Paracelsus’ alchemical ideas about gender and gender identity in Jungian psychology.

Title: Physical Sciences and the Great War

Abstract: 2014 marks the hundredth anniversary of the beginning of World War I. The 90-minute special session proposed here would be sponsored by the Physical Sciences Forum and considers the roles played by the physical

sciences during the Great War, as well as the effect of the war on the structure and content of the physical sciences. Following the pattern established last year (the first year the Forum met), the session would proceed as a series of 'provocations'—Five 5-minute comments by a series of speakers—followed by open discussion from the audience. David Aubin (Université Pierre-et-Marie-Curie) will discuss the history of mathematics in France and its Western Allies, drawing on his forthcoming co-authored book with Catherine Goldstein (Université Pierre-et-Marie-Curie); Jeffrey Johnson (Villanova University) will discuss chemistry during the war; Suman Seth (Cornell) will offer a few brief remarks on theoretical physics and WWI; Chen-Pang Yeang (University of Toronto) will discuss the physical and technological sciences related to military wireless communication and their implications for the organization of research and development; and Gregory Good (AIP) will highlight how the war disrupted the structure of geophysics.

Title: A Play of Scales? Modes of Generating Modern Biomedical Knowledge

Abstract: Recent historical accounts have emphasized projects, processes, rhetorical strategies through which biology became, and invoked, "Big Science" over the course of the twentieth century. Yet, the focus on the "big" and the "becoming bigger" has obscured the coexistence and interplay of the many, varied scales of biological knowledge production – particularly, this panel argues, those that are neither local nor global. Following scholarship on the endurance of multiple ways of knowing, this panel considers the interplay of social, temporal, and spatial middle scales and their generative role in the practice of the life science. It interrogates the persistence of "cottage industries", "boutiques", and other mid-scale forms of experimental lives in the modern biomedical sciences: first-in-man-trials in the Swiss pharmaceutical industry in the decades after the Second World War, scaled-up research on retrovirus research as supported by the National Cancer Institute in the 1970s, and the making of transgenic mice in the 1980s. It examines the contingency of economies of scale for biological work; the labor that goes into "scaling" experimental standards; technical, communicative or material bottlenecks; and the production of counter-intuitive, unexpected benefits and costs of the middle scales. In examining the interplay of different scales of knowledge production, this panel contributes to the on-going vibrant discussion of "Big Biology" and deepens the understanding of the social and material relationships in modern biology.

Title: The Politics of Discovery: The Physical Sciences in the 20th and 21st Centuries

Abstract: This session examines the relationship between science, technology, and politics in the late 20th and early 21st centuries. More specifically, each of these four papers explores how disciplinary identity and issues of intent, design, and use affected the theory and practice of the physical sciences in diverse settings. Catherine Westfall's paper analyzes how interactions between researchers, managers, and government officials affected the development and mission of the Jefferson Laboratory in Newport News, Virginia in the 1980s and 90s. Ann Robinson's presentation investigates the contentious debates between physicists and chemists in the United States and Soviet Union over the discovery of heavy elements in particle accelerators during the Cold War. Amy Fisher's talk examines the 1958 televised debate between Edward Teller and Linus Pauling, shedding light on their epistemological and political commitments regarding the development and use of nuclear weapons. And Erik Conway's paper investigates the role of scientists, engineers, and the institutional structure of NASA in shaping the objectives of Mars exploration. In particular, Conway addresses the question: why do planetary scientists at NASA continue to advocate for high-risk, high-cost Mars Sample Return missions when alternative, viable exploration programs exist? Highlighting different scales of analysis, these papers showcase how institutional, national, and international politics can shape the context of discovery and affect scientific practice.

Title: Post-Colonial Life and Politics of Colonial Science

Abstract: This panel traces colonial science under the Japanese Empire (1868-1945) into the post-colonial period. The significance of Japanese scientific enterprises undertaken in its colonies and occupied areas, such as Manchuria, Inner-Mongolia, and Korea, has been a subject of intense historical debates, as it entails a judgment as to whether

Japanese colonization and its scientific and industrial policies contributed to or hindered the development of Korea and Northeast China. In addition, Japanese scientists' positive evaluations of their research in the colonies have tended to be received as a justification of Japan's colonization of its neighboring Asian countries. Rather than repeating the debate, however, three papers on this panel focus on specific sites of colonial science and the complexity of their post-colonial lives. The objective of the panel is to highlight and explore the intricate postwar and postcolonial politics full of tensions and contradictions that defy simplified narratives. For Sakura Christmas' paper, the specific site is the evolutionary ecology developed by a Japanese ecologist and anthropologist, Imanishi Kinji, widely acknowledged as the founder of Japanese primatology. Her paper examines Imanishi's understudied scientific expedition in Inner Mongolia during the colonial period and its connection to his postwar scientific theory and politics. For Walter Grunden, it is Hungnam, the most industrialized city in colonial Korea that is now hosting the nuclear development project of North Korea. Hiromi Mizuno's paper traces the network of fertilizer under the Japanese Empire into the postwar and examines how it reconfigured after 1945 with Cold War politics.

Title: Re-Appropriation and Memory in Early Science

Abstract: We explore how scientific practitioners from antiquity through the sixteenth century appropriated, adapted, transformed, ransacked, or abused the work of their predecessors. In particular, we examine the augmentation of authoritative texts, the utility of doxographical accounts for reconstructing originals, mechanisms of collecting theories, adaptations of authoritative ideas, and the transmission of text and image among domains of inquiry. What results is a complex portrait of various means of appropriation that emerged over the longue durée.

Title: Replicating Early Modern Materials, Observations, and Experiments

Abstract: Although the replication of past experiments, instruments, and materials has long been a part of the history of science, attention to this topic has grown recently, partly as a result of the increasing interest in material culture generally. The historically sensitive reproduction of practices ranging from early artisanal techniques to the specialized laboratory procedures associated with the "experimental philosophy" of the 17th century provides important new avenues of research. This session highlights the growing role of historical replication in the history of science and showcases a variety of ways it can be carried out. Products from the artisan's workshop, what would have been seen under the anatomist's knife, the complex transformations of matter in the alchemist's furnace, and the precise materials, measurements, and calculations of natural philosophers are all represented. The early-modern period is particularly amenable to investigation through replication. It helps us see this often difficult to understand period in striking ways, at times making clear sense of otherwise recalcitrant texts. An increased amount of historical evidence compared to earlier periods provides greater opportunity for replication, while at the same time experiments were generally less technically complex than in later periods and the products of art less sophisticated. In short, opportunities are relatively abundant, barriers to entry relatively low, and the potential for gain particularly high. This session will draw upon the experience of historians studying a broad range of early modern disciplines in order to arrive at some general precepts concerning the value of historical replication.

Title: Representing Scientific Knowledge in 19th-Century Philadelphia

Abstract: Where were the centers for representing science in nineteenth-century America? How did people reinforce that centrality? American painter Gilbert Stuart called his home of Philadelphia "the Athens of America." As a cultural center for American arts and sciences, Philadelphia naturalists and anatomists, among others, developed professional relationships with artists, engravers and lithographers, in order to construct useful representations of their knowledge of the natural world. This panel looks at Philadelphia as a place where emergent scientific work found comparably sophisticated methods for its representations. We look to a variety of actors important to this development in Philadelphia: naturalists and anatomists who made observations, institutions that provided some context for scientific work, artists who envisioned representations, and artisans, such as engravers and lithographers, who materialized those representations. We discuss the agency that lay among these diverse

groups of actors in the nineteenth-century evolution of scientific representation, and the significant backdrop Philadelphia provided as influence over that representation.

Title: Rot: Scientific, Social and Cultural Engagements with Putrefaction

Abstract: Putrefaction, since the eighteenth century, has been a polyvalent presence in the history of science. It has cropped up at different times and in different forms in sciences as diverse as medicine and agronomy, ecology and chemistry, sanitation and architecture. Yet, it has been almost totally ignored by historians of science. The limited extant historiography confines enquiries within narrow disciplinary boundaries thereby presenting this protean presence as a misleadingly coherent entity. In fact the very entrapment of such a multivalent entity in a single corpuscular framework of a specific science is already problematic. In this panel, we hope to start a multi-sided conversation that approaches the process of putrefaction from three different disciplinary and geographic angles. Chris Hamlin examines the notion of 'putridity' in eighteenth century medical works. He points out the both the seeming ubiquity of the concept at the time as well as its lack of uniformity. Projit Mukharji's paper examines the adoption and vernacularization of Pasteurian ideas by agro-bacteriologist in Edwardian Bengal. Finally, Graham Mooney tracks the controversies around a train carrying human waste through the USA. He shows how rotting matter and the technological efforts to dispose it could not only exacerbate existing social tensions, but also produce unlikely political allies. Rot, then, emerges through the three papers as a many-headed and global presence whose stench permeates the histories of different sciences and of multiple continents.

Title: Roundtable: HSS and The Permeable Academy

Abstract: In the wake of the economic crisis of 2008 and the persistent discrepancy between the PhDs that awarded each year to posted positions, this panel joins a growing national dialogue about how better to prepare PhD students to explore careers beyond the academy. The talks explore different aspects of the Permeable Academy – a vision of higher education that would offer flexibility and fluidity between academic and non-academic careers for those trained in PhD programs. In addition to the economic, personal, and cultural factors that might push someone to look for work outside the academy, the panel will also consider the powerful ties that bind those outside traditional academic jobs to the field – how they continue to use and develop their skills and maintain their scholarly interests and identities. Rather than focusing on the "job crisis," we hope to broaden the dialogue to think about how Historians of Science can develop and leverage their skills and interests to pursue a broad range of careers. The session is aimed at both PhD-job seekers and those who advise them.

Title: Roundtable: Science and Supranationalism: Exploring the History of Science in Intergovernmental Organizations

Abstract: While international scientific cooperation has a long history, it became institutionalized to an extent never before seen following World War II. The increasing investments of national governments in scientific research coincided with the widespread proliferation of intergovernmental groups to address issues such as nuclear technology, public health, agricultural production, and the protection of the environment. By the mid-1960s, there were over 50 intergovernmental bodies engaged in scientific activities in these and other areas alongside hundreds of nongovernmental international groups. Science and policymaking in this rapidly expanding mélange of intergovernmental settings is an area ripe for further scholarship, and historians of science as well as international historians have recently begun to converge on the role of scientists in these new intergovernmental associations and how such groups shaped many scientific fields during the second half of the 20th century. Participants in this roundtable, drawing on their own studies of science in organizations such as the International Atomic Energy Agency, the World Health Organization and the International Council for the Exploration of the Seas, will discuss these historical developments and avenues for future historical research on science and policymaking in intergovernmental organizations. Topics of conversation will include how and why scientific expertise was given authority among policymakers in various intergovernmental contexts, to what extent these organizations facilitated

new ways of doing international, collaborative research, and more broadly, what historical studies of science in these new institutional contexts can reveal about the production of knowledge and international policy in this period of accelerating globalization.

Title: Science and the Technocratic Making of Modern China

Abstract: This panel focuses on the relationship between knowledge and socio-political order by exploring the role of science and technology in the construction and maintenance of the modern Chinese empire/Republic. The establishment of scientific and technological institutions in China during the first half of the twentieth century produced new knowledge about China's resources and naturalized the idea of China as a unified state. In order to understand the "scientific outlook to economic development"—the catch phrase of the modern Chinese developmental state—one needs to re-examine how scientists and engineers interacted with Chinese political institutions during the transition from empire to the People's Republic. To that end David Luesink examines the how a non-state network pre-empted a strong ministry of education to create a nationally accepted vocabulary of science. Yingjia Tan's paper looks at the patron-client relationship between the Chinese military and the electrical power industries between the War of Resistance and the early years of the People's Republic. Shellen Wu's paper addresses the role of geographers and political scientists in the exploration of natural resources in the 1950s. Together, all three papers construct a narrative of the central place of science in the making of a modern Chinese state.

Title: Scientific Expertise in the Peripheral and the Emerging Contexts of Science

Abstract: An important phase of a scientific practice is how people come to join that practice. On this matter, most of our analyses of science have been shaped by one primary model – contributions in science have been mostly viewed from the perspective of those who have inherited an existing practice from other veterans, and crafted their contributions within that continuous context. This of course focuses our attention upon a few Euro-American communities as the source of all scientific creativity, and directs our attention away from all other cases and sites of scientific reasoning. Yet, outside of this well-known scenario, there exists an equally important model for engaging in science, i.e., by self-training or self-introduction. Many important episodes of science, such as the case of Bose-Einstein statistics, have been produced from that context, and indeed, several non-Western scientific communities had historically began their track record from such a starting point. The goal of this session is to look for models and case studies of this situation by examining the practices of science in a wide variety of contexts, and mostly from the points of view of those who function outside the arena of a professionally trained community. The case studies are drawn from biology in Latin America, theoretical physics in the 20th century colonial India, and zoology in Japan. The aim of this exercise is to identify a wider group of stakeholders as the source of scientific creativity, and also see science as a trans-national practice.

Title: Scientific Objects and the Objects of Science

Abstract: The notion of a 'biography' of a scientific object has merited a great deal of weight since Daston's edited volume Biographies of Scientific Objects appeared in 2000. According to the principles laid forth by the volume's editor, the reality of a scientific object is dependent upon the intensity with which said object is woven into an epistemic framework. While this approach to understanding scientific objects may have merit, the metaphor of a 'biography' implies a linear history to such objects, which seems problematic given the histories of many scientific objects. The proposed session explores the boundaries of the biography metaphor by presenting histories of objects that were either Lazarus-like in their connection to a particular epistemic framework, or were co-opted for different fields and purposes throughout various stages of their history, leading to a schizophrenic-at-best 'biography'. Each of these papers relates a history of a specific object or technology whose story provokes a serious revision of the 'biography' metaphor. Taken together, these papers will challenge our understanding of how science mediates our knowledge of objects, and how objects themselves reciprocally affect science.

Title: SciViroTech, or Science that Materially Changed the World

Abstract: This session explores how science has had significant effects on the material world. These papers begin with moments of discovery, then follow new ideas "out of the lab" to see how they came to reshape things and places. Each author includes measurements of the consequent material effects and explains the significance of those material changes. The cases reveal institutions and communities of practice mediating between the texts characteristic of science, and large-scale rearranging of matter that characterizes agriculture, industrial production, the built environment, and war-making. Kimberly Killion explicates the career of nutrition scientist Myer Jaffa, showing how California's new Food and Drug Laboratory used chemical analysis to promote consumption of fresh fruits and vegetables, which helped transform the state's agricultural landscape at the turn of the 20th century. Lydia Xynogala traces the long impact of Dmitrii Mendeleev's 1899 travel report and geological survey that became a powerful impetus for Stalin as he sought to transform the southern Urals into an industrial region 30 years later. Jameson Karns connects Japanese efforts to weaponize the jet stream to changes in American forestry practice during World War II, using innovative historical methods including GIS mapping and meteorological metadata. James Skee examines management science as persuasive tool, showing how business consultants used operations research and systems analysis to convince diverse constituencies to support the reconstruction of Seattle for the 1962 Exposition. Commentator Roger Turner will discuss how the papers integrate the history of science into the focus on materiality that has characterized EnviroTech scholarship.

Title: Shapes and Contours of Early Modern Knowledge

Abstract: The study of nature in the early modern period was intrinsically intermedial. Scholarly and artisanal practitioners across disciplines engaged wide-ranging artistic and literary practices in a variety of media and formats in order to make sense of observations. This panel explores the ways in which scholars and artisans using multiple genres (textual, visual and artefactual) dealt with the challenges of comparing and synthesizing information collected by multiple observers. It also interrogates the ways in which particular epistemic genres in turn shaped methods for the investigation of nature. At stake was a potential challenge to engagements with nature: in order for observational knowledge to be authoritative, it needed to be brought into conversation with information and theoretical frameworks from multiple sources and varied witnesses, often by practitioners who did not perform these observations themselves. The comparative and interrogative practices of such compilers challenged nascent disciplinary boundaries and strengthened interdisciplinary, intermedial approaches to the making of knowledge about nature.

Title: Technicians Visible and Invisible: Implications for Scientific Knowledge

Abstract: With some important exceptions, technicians have been relatively invisible in accounts of scientific knowledge production (Shapin 1989; Gay 2007). Even when acknowledged, technicians are mostly portrayed as instrumental adjuncts to the 'real' scientific work. Recent scholarship, however, has focused on technician's own realms of expertise as they are brought to bear on fact making in the laboratory. If technicians are seen as having their own modes of expertise - with their own methods of sense making, their own bodies of knowledge, and their own community practices, what are the implications for scientific knowledge production? In this view, rather than scientific fact making serving as the basis for negotiations over expertise, negotiations about expertise inside the laboratory are at the core of scientific knowledge production. In these accounts, a rich sociality around defining and policing the scientist-technician boundary in the laboratory emerges. Is the presence of this kind of sociality, so intertwined in the intimate details of knowledge making, implicated in the facts that emerge from laboratories, or can the facts of science rise above this form of the epistemic politics of their production? Is the answer to this question dependent on the type of science under study? This session will explore these questions by looking at different valences of scientist-technician interactions from paleontology, synchrotron x-ray physics, and animal behavior genetics.

Title: Technoscience as Practice: Creating Communities / Constructing the Self

Abstract: Since the late 1970s, "practice" has emerged as an important analytic concept in the history of science and STS more generally. Yet the usage of practice has shifted over time. From an early narrow focus on experimentation, "practice" eventually expanded to envelope a range of activities intended to cultivate certain kinds of people and particular forms of community. In this session, we aim to draw attention to this shift and to reflect more consciously on the new kinds of questions and tensions that it opens for historical study. Our session (comprised of historians and philosophers) is thus a mix of theoretical papers and more concrete explorations of how this holistic notion of practice. First, Tom Stapleford offers an overview of "The Historiography of Practice," laying out a framework in which the subsequent papers can be situated. Next, the philosopher Dan Hicks introduces his use of social practices (developed from neo-Aristotelian virtue ethics) as a way of better understanding the role of values in technoscience and discriminating between values that can advance a practice and those that can subvert it. Catherine Jackson then provides a close study of practice in the research laboratory of the German chemist Emil Fischer at the turn of the twentieth century, an account in which Jackson confronts the limits of social analysis and the significance of individual traits. Finally, Edward Jones-Imhotep describes how broad Cold War concerns about rationality, trust, and control became embodied in a seemingly small-scale problem of practice: how to diagram electronic circuits.

Title: Testing Drugs and Trying Cures in the Early Modern World

Abstract: This panel seeks to investigate the processes and practices through which early modern individuals tested and evaluated medicinal cures. The testing of remedies has long been mentioned as an important precursor to the Baconian "experimental philosophy," but only recently have historians begun to examine the specifics of drug testing in the early modern world. The more scholars have looked, the more they have found evidence of systematic drug testing by a wide variety of individuals: apothecaries, Jesuits, women, empirics, distillers, physicians, princes, and priests. In four papers spanning a wide geographical area of Europe and the Ottoman Empire, these panelists all delve into specific ways in which drugs were evaluated – and in which we, as historians, should evaluate the place of pharmacy in the history of experiment. The panel begins with Evan Ragland's reassessment of the origin of the term "to make a trial," placing it in medicine rather than mathematics. The three subsequent panelists demonstrate specific ways in which trials were made of particular drugs and in which information on drug testing traveled. From Erik Heinrich's exploration of a longstanding plague cure using a live chicken chickens to Harun Küçük's study of Paracelsianism in the Ottoman Empire to Samir Boumediene's examination of the widespread practice of testing exotic cures on poor hospital patients, these papers present the varied ways in which early modern practitioners assessed drugs and communicated information about them.

Title: Thought Experiments as an Epistemic Practice in the Natural and Social Sciences, 1830–1930

Abstract: The session on "Thought Experiments as an Epistemic Practice in the Natural and Social Sciences, 1830–1930" aims to examine the role of ideal types, thought experiments and narrative models in the history of science during the nineteenth and early twentieth centuries. While a lot of work has focused on contemporary theories of ideal types, thought experiments or narrative models, our session is going to concentrate on concrete practices of these phenomena and their repercussions for more theoretically minded propositions that often were issued by the same persons. Meticulous case studies on luminaries from a wide array of disciplines, like Charles Lyell in geology, Ernst Mach in physics or Max Weber in sociology, are expected to (a) demonstrate that thought experiments and related entities form an integral, self-reflexive part of nineteenth and twentieth century science as well as (b) show that the borders both between disciplinary cultures and between fact and fiction remained porous and dynamic for a long time. The proposed session hence strengthens two strands of recent discussion: On the one hand it contributes to practice-centered approaches in the history of science and on the other hand it provides further empirical evidence

for a more complex vision of the multifarious relationships among scientific fields beyond the binary divides of ‘erklären’ and ‘verstehen’ or ‘two cultures’.

Title: The “Three-Man Paper” and its Ramifications

Abstract: The recent translation and commentary on the 1935 paper “The Nature of the Gene and Gene Mutation” by Nicolai Timoféef-Ressovsky, Karl Zimmer, and Max Delbrück, edited by Phillip Sloan and Brandon Fogel (Sloan & Fogel 2011) revisits, in the most thorough form to date, the historical and philosophical context of the “Delbruck Seminars.” The latter was an informal gathering of scientists from various areas in physics and biology in Berlin in the period 1934-1937 who shared an interest in the interactions of physics and biology which they applied to problems of radiation biology, gene mutation and photosynthesis. The so-called “Three Man Paper” has been considered by some scientists and historians as one of the origins of molecular biology, with this paper forming much of the scientific background for Erwin Schrödinger’s later influential What is Life? lectures (1943). This also involved the first entry of the seminar’s host, Max Delbrück, into biology after his formation as a nuclear physicist. It initiated his transition to a career in molecular biology that resulted in the joint award of the Nobel Prize in Physiology in 1969 for his work on replication in viruses. In this session, several different aspects of the background, influence, and comparative dynamics of the “Three-Man” Paper and the Delbrück seminars will be explored. This will pose wider questions for the historiography of science which our session will address.

Title: Trans-Atlantic Conduits: Circulating Scientific Knowledge in Early Modern Empires

Abstract: The early modern transatlantic empires of Spain, England and France were not isolated from each other and intellectual developments originating in any one empire easily circulated throughout Europe and the Americas. Instead the Atlantic World comprised a highly porous intellectual system that generated new natural knowledge challenging old preconceptions. The three papers on this panel grapple with the issue of how scientific information circulated around the Atlantic World from the late sixteenth century to the early nineteenth century. Antonio Barrera explores how scientific knowledge from a global empire becomes appropriated by an aspiring colonial nation during the late sixteenth and early seventeenth centuries. In Marcelo Aranda’s paper he discusses how the Society of Jesus disseminated a mathematical tradition that originated with Christopher Clavius in Rome to seventeenth century Madrid and Mexico City through its network of teachers, missionaries and students. Finally, Julia Mansfield’s presentation highlights the case of an Italian doctor circulating knowledge about pandemics in the Mediterranean and the Atlantic during the Napoleonic Wars.

Title: Transnational Biomedical Expertise in Modern China

Abstract: The complex relations between the Chinese Communists, Nationalists, and their foreign allies, especially the United States and the Soviet Union since World War II have left imprints in biomedical knowledge and practices in both mainland China and in Taiwan where the Nationalists fled in 1949. This session, through four cases ranging from the late 1930s to the late twentieth century, addresses the question how transnational fluxes of scientific expertise in the changing international relations impacted biomedical knowledge and practice as well as their social and cultural stakes in the greater China. Through examining the wartime Yale-in-China program, Shenglan Li shows that the American model of scientific nursing struggled to maintain its ideals but also to meet the Nationalist government's demands. During the Cold War, Taiwan became a destination of Chinese American biomedical researchers. Zuoyue Wang shows how such visits not only benefited Taiwan’s biomedicine but also helped to maintain a Chinese cultural nationalism. By comparing the developments of the contraceptive pill and its particular uses in the 1950s and 1960s in the US and China, Haiyan Yang demonstrates that state ideology and centralized drug developments made the innovation and usage of the pill in China disparate from its US developments in which the Chinese American biologist Min Chueh Chang played a key role. Lijing Jiang shows that a recent controversy about Chinese American biologist Niu Manjiang’s work in transforming goldfish, rice, and cancer cells, is best understood through a historically transnational discussion about the relation between science and politics.

Title: Transnational Technology Networks and Knowledge-Diffusion during the Cold War

Abstract: This panel explores the role of transnational networks in knowledge-diffusion during the Cold War. The four papers study how the networks spanned across parts of the developed as well as the developing world, and facilitated knowledge transfers in atomic energy, and more largely postwar industrial science.

Title: Under Threat: The Sciences of Extinction and Endangerment since 1850

Abstract: At the nexus of scientific research into the health of ecosystems and wild populations, public policies governing the use or protection of natural resources, and popular conceptions of nature lies a seemingly omnipresent threat: that of permanent loss or extinction. This is conceived as resulting from human neglect, depletion, or destruction, or else from inevitable non-human processes. Contemporary research into extinction is often motivated by a desire not only to understand this process but also to mitigate against it. This panel examines the emergence of such ideas about extinction and endangerment in various areas of research since the mid-nineteenth century. We move away from the iconic case of “endangered species” to consider other objects of concern, including human races, agricultural varieties, organic processes such as reef formation, and even the faunas and floras of entire epochs. Qureshi (on endangered human races in the nineteenth century) and Sepkoski (on the biodiversity crisis in the twentieth) each present a scientific episode that they argue helped to shape the commonly held Western view of what counts as threatened in nature. Sponsel (on perceptions of coral reefs) and Curry (on the loss of genetic diversity in agricultural crops) explore cases in which an object transitioned from being seen as robust, even threatening, to being seen as vulnerable to complete destruction. By examining an evolving range of threatened entities and perceived threats, this panel offers new perspectives on how and why many aspects of "nature” have come to seem both at risk and worth protecting.

Title: What Chemistry has Brought to Philosophy: Philosophical and Historical Perspectives

Abstract: Most historical narratives about the socio-cultural impact of chemistry have been framed in the medical, industrial, or military contexts. However, a recent surge of interest in the philosophy of chemistry suggests that we can legitimately ask how chemistry has nourished philosophy over time. Indeed, Bernadette Bensaude-Vincent recently advocated that chemistry can be "food for thought," or in French "matière à penser," in her Matière à penser: Essais d'histoire et de philosophie de la chimie (Paris: Presses universitaires de Paris 10, 2008). This emerging question is just the opposite to a more frequently asked question, namely the impact of philosophy on chemistry, and therefore merits fresh scholarly attention from both historians and philosophers. This interdisciplinary session addresses what chemistry has brought to philosophy by examining contemporary and historical cases through three overarching approaches: first, to examine how past and present chemistry helps elucidate important philosophical concepts (e.g. similarities, affordance, and emergence); second, to analyze how chemical models and metaphors were historically used in part of philosophy (e.g. psychology in the first half of the nineteenth century); and third, to bring a new analytical tool pertaining to chemistry (know-how/know-that) into the history and philosophy of science. The commentator then provides connections between philosophical and historical approaches to this question. In the process, we aim to facilitate discussion between historians and philosophers.

Title: Who’s in Charge? Alternative Actors in Late Nineteenth-Century Nutrition Science

Abstract: This session investigates questions of authority, agency and expertise in the early decades of nutrition science. Although nutritional physiology emerged as a sub-field of physiology only after 1860, nutritional physiologists claimed the authority and prestige of science to support their nutritional and dietary standards, develop feeding regimes for institutions and the military, and advised on dietary matters in public health debates. This authority was, however, challenged at all levels. Experimental subjects challenged the physiologists in the

conduction of experiments, the interpretation of results, and the claims that could be made for knowledge derived from the study of their bodies. Hunger artists, vegetarians, dietary and life reformers, and even randomly selected subjects showed themselves to be agents and actors, who influenced the course of experimentation, as well as experts for their own bodies and diets. While physiologists were dependent upon the cooperation of their subjects, these subjects frequently came with their own agendas. The papers in this session present three arenas in which nutrition experimenters and alternative actors negotiated their terms of engagement, battled for authority, cooperated, resisted and used one another to promote themselves and their dietary assumptions.

Title: Women's Resistance to and Appropriation of Eugenic Social Reforms

Abstract: From the beginning of the American eugenics movement, mostly male professionals were eager to attract and include women as advocates, fieldworkers, and popularizers. However, many women who became involved in eugenic social reforms were not content with such subordinate roles, and some actively resisted eugenic orthodoxy in their work. Ben Harris' paper focuses on the case study of Isabelle Kendig, a eugenic field worker who dared to publicly disagree with Charles Davenport's conclusions about the degeneracy of the Pratt family of Massachusetts. Similarly, Kelly O'Reilly's paper examines Mildred Delp, a registered nurse who was hired to promote birth control among migrant women in California. She resisted and modified the eugenic agenda of male professionals by placing birth control within a larger discourse of social work during the New Deal. Susan Rensing's paper explores how women's reformers successfully pushed for eugenic marriage laws, much to the consternation of professional eugenicists who derided such laws as not sufficiently eugenic. Katrina Jirik's paper argues that women seeking admission to state institutions for the feeble-minded for a family member resisted the experts' negative eugenics message that institutional placement was necessary to prevent procreation by ignoring it, as they had diverse reasons, based on the best interest of the child or family.