2025 HSS ANNUAL MEETING

Sheraton New Orleans

Program Co-Chairs
Christina Ramos
Christopher Heaney

13-16 November

Thursday November 13, 2025

	8:00am	9:00am	10:00am	11:00am	12:00pm	1:00pm	2:00pm	3:00pm	4:00pm	5:00pm	6:00pm	7:00pm	8:00pm
Sheraton New Orleans 3rd Floor Borgne						**1:00p - 5:00p** HSS Council Meeting							
Sheraton New Orleans 4th Floor Ellendale		**9:00a - 12:00p** HSS Executive Committee Meeting											
Sheraton New Orleans Napoleon A1					**12:00p - 1:30p** The Compassionate Gatekeepers: Increasing the Number of The Underrepresented in STEM Fields		**2:00p - 3:30p** Animals and the Making of Modern Science: Experimentation, Empire, and the State		**4:00p - 5:30p** Measuring Publics				
Sheraton New Orleans 3rd Floor Napoleon A2					**12:00p - 1:30p** Translations of Science in Imperial East Asia		**2:00p - 3:30p** What's Proof Got to do with it? Benefits of the Doubt in Environmental Science and Policy		**4:00p - 5:30p** Animals and the History of Science in East Asia				
Sheraton New Orleans 3rd Floor Napoleon A3					**12:00p - 1:30p** Radiating Sciences		**2:00p - 3:30p** Bureaucratic Imaginaries and Everyday Practice in the Late Twentieth Century		**4:00p - 5:30p** Eugenic Thinking				
Sheraton New Orleans Napoleon B1					**12:00p - 1:30p** Origins and Narratives in the History of Science		**2:00p - 3:30p** Mysticism and Management: Re-Enchanting Scientific Ignorance		**4:00p - 5:30p** The Technoscience of Sound				
Sheraton New Orleans 3rd Floor Napoleon B2					**12:00p - 1:30p** Beauty, Love, and Hygiene		**2:00p - 3:30p** Subject to Mediation: Bodies, Matter, and Media in the Human Sciences		**4:00p - 5:30p** New Approaches to Early Modern Medicine				

Thursday November 13, 2025

	8:00am	9:00am	10:00am	11:00am	12:00pm	1:00pm	2:00pm	3:00pm	4:00pm	5:00pm	6:00pm	7:00pm	8:00pm
Sheraton New Orleans Napoleon B3					**12:00p - 1:30p** Botany and Horticulture in Britain and the Americas		**2:00p - 3:30p** Rethinking Sources in the Study of Ancient Science		**4:00p - 5:30p** Alternative Science Studies and Conservative Critique				
Sheraton New Orleans 3rd Floor Napoleon C											**6:00p - 7:30p** Science in American Life: Reflecting on the Public History of Science at the U.S. 250th		
Sheraton New Orleans 3rd Floor Napoleon D													**7:30p - 9:00p** HSS Opening Reception
Sheraton New Orleans 3rd Floor Napoleon Registration Desk				**11:00a - 6:00p** Registration Day 1									
Sheraton New Orleans 3rd Floor Poydras					**12:00p - 5:00p** GECC Welcome Room Day 1								

Friday November 14, 2025

	7:00am	8:00am	9:00am	10:00am	11:00am	12:00pm	1:00pm	2:00pm	3:00pm	4:00pm	5:00pm	6:00pm	7:00pm
Sheraton New Orleans 4th Floor Bayside ABC					**11:00a - 12:30p** (De)colonizing the Clinic: Medicine, Race, and Power in Twentieth-Century Egypt			**2:00p - 3:30p** Transnationalism and Science in Cold War Asia		**4:00p - 5:30p** Beyond Botany: Plant Knowledges in Asian Studies			
Sheraton New Orleans 3rd Floor Borgne			**9:00a - 10:30a** Forum on Science and Knowledge in Latin America and the Caribbean		**11:00a - 12:30p** Diagnosing the Self: Immunity, Irrationality, and Habit			**2:00p - 3:30p** Popularizing 20th Century Sciences		**4:00p - 5:30p** Press and Audiences in Mexico (18th-20th Centuries)			
Sheraton New Orleans Edgewood					**11:00a - 12:30p** Crafting Knowledge in the History of Art			**2:00p - 3:30p** New Books in the History of U.S. Health		**4:00p - 5:30p** Residues and Afterlives of Chemical and Biological Weapons Programs			
Sheraton New Orleans 3rd Floor Maurepas		**7:30a - 8:45a** Women's Caucus Breakfast											
Sheraton New Orleans Napoleon A1			**9:00a - 10:30a** Pacific Circle		**11:00a - 12:30p** Contested Boundaries and Emerging Terrains: In Memoriam for Mary Terrall			**2:00p - 3:30p** Public Health in the Late 19th Century		**4:00p - 5:30p** Zoonotic Entanglements: Histories of Diseases, Cultures, and Attitudes in Asia			
Sheraton New Orleans 3rd Floor Napoleon A2			**9:00a - 10:30a** Forum for the History of Science in Asia (FHSAsia)		**11:00a - 12:30p** The Politics of Technological Innovation in China			**2:00p - 3:30p** Translation and Interpretation in the Early Modern World		**4:00p - 5:30p** Women's Knowledge and Agency in Early Modern Resource Management			
Sheraton New Orleans 3rd Floor Napoleon A3			**9:00a - 10:30a** Early Sciences Forum		**11:00a - 12:30p** Ancient Sciences in the Academy: Retrospect and Prospect			**2:00p - 3:30p** Expedition Sciences		**4:00p - 5:30p** Family Matters: The Stuff of Heredity in Greco-Roman Antiquity			

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Sheraton New Orleans Napoleon B1			**9:00a - 10:30a** Forum for the History of Health, Medicine, and the Life Sciences		**11:00a - 12:30p** Managing Dead Bodies: Global Public Health, Medicine, and Law			**2:00p - 3:30p** Spirits and Disease in Medieval and Early Modern [European] Medicine		**4:00p - 5:30p** Proxies: Producing Knowledge through Indirect Indicators			
Sheraton New Orleans 3rd Floor Napoleon B2			**9:00a - 10:30a** Forum for the History of the Chemical Sciences		**11:00a - 12:30p** Chemistry by Other Names: Tracing Chemical Knowledge Across Disciplines			**2:00p - 3:30p** Nature, Locality, and the Polemics of Equivalence in the Global Plant/Commodity Trade		**4:00p - 5:30p** Psychology, Race, and Empire in the Americas			
Sheraton New Orleans Napoleon B3			**9:00a - 10:30a** Forum for the History of the Mathematical Sciences		**11:00a - 12:30p** Adding it Up: The Past and Future of History in the Mathematics Classroom			**2:00p - 3:30p** Thinking with Primates		**4:00p - 5:30p** Contesting Life and Liberty in New Landscapes: A Reconceptualization of Public Health during the First Great Migration in the United States			
Sheraton New Orleans 3rd Floor Napoleon C			**9:00a - 10:30a** Forum for the History of Human Science		**11:00a - 12:30p** Osiris Volume 40: 'Knowing Animals, Moving Animals' Roundtable			**2:00p - 3:30p** Modernizing Enlightenments in the Global History of Science		**4:00p - 5:30p** Spaces of Inquiry: Making Science and Technology in the Modern World		**6:00p - 7:30p** HSS Distinguished Lecture: Conevery Valencius	
Sheraton New Orleans 3rd Floor Napoleon D				**10:00a - 5:00p** Exhibit Hall Day 1									
Sheraton New Orleans 3rd Floor Napoleon Registration Desk		**8:00a - 5:00p** Registration Day 2											
Sheraton New Orleans 4th Floor Nottoway			**9:00a - 10:30a** Earth and Environmental Sciences Forum		**11:00a - 12:30p** Sciences of Waste/Wastes of Science I			**2:00p - 3:30p** Sciences of Waste/ Wastes of Science II		**4:00p - 5:30p** Beyond-Human Sciences of Sea and Space			

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Sheraton New Orleans 4th Floor Oak Alley					**11:00a - 12:30p** Astronomical Futures: The Waning Cold War and Imagined Futures of the Outer Worldly			**2:00p - 3:30p** Water and Power in the History of Science		**4:00p - 5:30p** (Re)Collecting Life and Death at the University			
Sheraton New Orleans 3rd Floor Poydras			GECC Welcome Room Day 2 **9:00a - 5:00p**										
Sheraton New Orleans 3rd Floor Poydras						**12:30p - 1:45p** GECC Listening Session							

Saturday November 15, 2025

	7:00am	8:00am	9:00am	10:00am	11:00am	12:00pm	1:00pm	2:00pm	3:00pm	4:00pm	5:00pm	6:00pm	7:00pm
Sheraton New Orleans 4th Floor Bayside ABC			**9:00a - 10:30a** Sciences of Environment from Earth to Mars		**11:00a - 12:30p** Knowledge, Visions, and Power at the Intersections of Social Sciences and Technology			**2:00p - 3:30p** Thinking like Machines: Computation, AI, and Origins		**4:00p - 5:30p** Embodied Temporalities			
Sheraton New Orleans 3rd Floor Borgne			**9:00a - 10:30a** Technologies of Visualization		**11:00a - 12:30p** Insects, People, and Alternative Histories of Entomology			**2:00p - 3:30p** Miraculous Sights and Sounds: Disability and Knowledge		**4:00p - 5:30p** New Phases of Astronomy in the 19th and 20th Century			
Sheraton New Orleans Edgewood			**9:00a - 10:30a** Finding Insects in the History of Science		**11:00a - 12:30p** New Books in the Global History of Science			**2:00p - 3:30p** Teaching and Textbooks in the History of Science		**4:00p - 5:30p** Knowing Ancient Mesopotamia			
Sheraton New Orleans 3rd Floor Maurepas		**7:30a - 8:45a** HSS Chair's Breakfast											
Sheraton New Orleans Napoleon A1			**9:00a - 10:30a** “Scams” and Epistemic Denial in the History of Science		**11:00a - 12:30p** Transness, Autism, and the Social Histories of Diagnosis			**2:00p - 3:30p** Divining Sciences in Islamic Scholarly Traditions		**4:00p - 5:30p** Ecologies of Exposure: The Mississippi Delta			
Sheraton New Orleans 3rd Floor Napoleon A2			**9:00a - 10:30a** Indigenous Knowledge in Spanish America		**11:00a - 12:30p** Then and Now The Enduring Allure of Genetic Determinism			**2:00p - 3:30p** Getting Creative with Research and Funding: Tacit Knowledge Roundtable		**4:00p - 5:30p** Women's Mentorship Event			
Sheraton New Orleans 3rd Floor Napoleon A3			**9:00a - 10:30a** Recipes and Epistemological Exchange in Premodern Asia		**11:00a - 12:30p** Engendering Health in the Americas			**2:00p - 3:30p** Knowing an Empire: Early Modern Spanish and Chinese Worlds in Dialogue		**4:00p - 5:30p** Scientific Internationalism: What Might the Past Tell Us about Our Present Moment?			

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Sheraton New Orleans Napoleon B1			**9:00a - 10:30a** Sciences of Mind		**11:00a - 12:30p** GECC Lightning Talks			**2:00p - 3:30p** Chemistries across Time		**4:00p - 5:30p** From Trust to Crisis: Scientific Credibility and Institutional Legitimacy in the 20th Century			
Sheraton New Orleans 3rd Floor Napoleon B2			**9:00a - 10:30a** Solidarity and Labor in 20th Century Science		**11:00a - 12:30p** Satellite Data, Environment, and Infrastructures of Power			**2:00p - 3:30p** After The Probabilistic Revolution Revolution		**4:00p - 5:30p** Knowledge Economies			
Sheraton New Orleans Napoleon B3			**9:00a - 10:30a** The Science and Rhetoric of Climate Change		**11:00a - 12:30p** Making a Tropical Island: Classifying Taiwan's Place in the World, from the Qing Empire to the Cold War			**2:00p - 3:30p** Give Me East Asia and I will Raise the History of Science: New Frameworks from Human, Capital, Cement, and Fish Swimming across Boundaries		**4:00p - 5:30p** The China Boxer Indemnity Program (1909-1944) and China US PhD Application Programs (1979-1989)			
Sheraton New Orleans 3rd Floor Napoleon C			**9:00a - 10:30a** Eugenics and the "Normal" in the U.S., 1910s-1950s		**11:00a - 12:30p** Improving Professional Development in History of Science Graduate Training (GECC Professionalization Event)			**2:00p - 3:30p** Mind, Labor, and Movement: Metaphors in Histories and Futures of Communications Technologies		**4:00p - 5:30p** Sexing Sciences, Sciencing Sex		**6:00p - 7:30p** HSS Prize Ceremony & Sarton Q&A	
Sheraton New Orleans 3rd Floor Napoleon D			**9:00a - 5:00p** Exhibit Hall Day 2										
Sheraton New Orleans 3rd Floor Napoleon Registration Desk			**8:00a - 5:00p** Registration Day 3										

Saturday November 15, 2025

	7:00am	8:00am	9:00am	10:00am	11:00am	12:00pm	1:00pm	2:00pm	3:00pm	4:00pm	5:00pm	6:00pm	7:00pm
Sheraton New Orleans 4th Floor Nottoway			**9:00a - 10:30a** New Approaches to Early Modern Science		**11:00a - 12:30p** Early Sciences Forum: Liminality and the Margins of Disciplines			**2:00p - 3:30p** Futures Roundtable: Accessibility and the History of Science		**4:00p - 5:30p** Making Human Difference: New Perspectives on Racial Science			
Sheraton New Orleans 4th Floor Oak Alley			**9:00a - 10:30a** New Oral Histories and Archives in the U.S. History of Science		**11:00a - 12:30p** Scientific Genealogies of Whiteness as Natural Norm			**2:00p - 3:30p** The Use and Abuse of Weather Data from the Early Modern Period		**4:00p - 5:30p** Making and Shaping Humans, Animals, Plants, and Minerals in the Medieval and Early Modern World			
Sheraton New Orleans 3rd Floor Poydras			**9:00a - 5:00p** GECC Welcome Room Day 3										

Sunday November 16, 2025

	7:00am	8:00am	9:00am	10:00am	11:00am	12:00pm	1:00pm	2:00pm
New Orleans Pharmacy Museum Courtyard								**1:30p - 3:00p** HSS Elizabeth Paris Lecture
Sheraton New Orleans 4th Floor Bayside ABC			**9:00a - 10:30a** Engaging with Improbable Experiments		**11:00a - 12:30p** Maternal and Fetal Health in the History of Science			
Sheraton New Orleans 3rd Floor Borgne			**9:00a - 10:30a** Shaping Matter, Shaping Text: Practical Knowledge-Making in the Pages of Early Modern Books		**11:00a - 12:30p** Globalizing Knowledges in Colonial and Post-Colonial India			
Sheraton New Orleans Napoleon A1			**9:00a - 10:30a** Specializing in the Wholly Impossible: Black Health Activism in the 20th Century US		**11:00a - 12:30p** Biography and Causation in the History of Science			
Sheraton New Orleans 3rd Floor Napoleon A2			**9:00a - 10:30a** Gendering Mind and Body in the Recent History of Psychological Culture		**11:00a - 12:30p** Thinking with Birds			
Sheraton New Orleans 3rd Floor Napoleon A3			**9:00a - 10:30a** Margins of Belief: Science, Religion, and Alternative Worldviews in Late 19th and Early 20th Century America		**11:00a - 12:30p** Aquascaping: Knowledge and Infrastructure in Global River History			
Sheraton New Orleans Napoleon B1			**9:00a - 10:30a** Ocean Infrastructures and Future Oceans		**11:00a - 12:30p** New Approaches to the History of Science in Premodern and Imperial China			

Sunday November 16, 2025

	7:00am	8:00am	9:00am	10:00am	11:00am	12:00pm	1:00pm	2:00pm
Sheraton New Orleans 3rd Floor Napoleon B2			**9:00a - 10:30a** The Circulation and Transformation of Knowledge in East Asia: A Transnational Approach		**11:00a - 12:30p** Cells and Systems in 20th Century Medical Research			
Sheraton New Orleans Napoleon B3			**9:00a - 10:30a** Rethinking Critique and the Making of 20th-Century Science		**11:00a - 12:30p** Early Modern Collections, Modern Museums			
Sheraton New Orleans 3rd Floor Napoleon C		**7:30a - 8:45a** HSS Member Business Meeting	**9:00a - 10:30a** Fragility and Resistance: Museum Collections as Living Ecosystems a CALM Caucus Futures Roundtable		**11:00a - 12:30p** Ethics, Eugenics, and Experimentation in Medical Research			
Sheraton New Orleans 3rd Floor Napoleon D			**9:00a - 11:30a** Exhibit Hall Day 3					
Sheraton New Orleans 3rd Floor Napoleon Registration Desk		**8:00a - 11:30a** Registration Day 4						
Sheraton New Orleans 4th Floor Nottoway			**9:00a - 10:30a** Scientific Authority and Accountability in the History of Archaeology		**11:00a - 12:30p** Imperial and “Native” Varieties of Science in Africa			
Sheraton New Orleans 4th Floor Oak Alley			**9:00a - 10:30a** Complicating the Role of the State in Central American Health and Wellness, 1900-2020.		**11:00a - 12:30p** Cold War Convergences of Time and Space			
Sheraton New Orleans 3rd Floor Poydras			**9:00a - 11:30a** GECC Welcome Room Day 4					

THURSDAY, NOVEMBER, 13

001. HSS Executive Committee Meeting
Business Meeting
9:00 to 12:00 pm - Thursday 13 Nov.
Sheraton New Orleans: Floor 4th Floor - Ellendale
Chair:
Evelynn Hammonds, Harvard University
Participants:
Soraya de Chadarevian, University of California, Los Angeles
Emily Hamilton, University of Massachusetts, Amherst
Matthew Shindell, Smithsonian National Air and Space Museum
Pratik Chakrabarti, University of Houston
Elise K Burton, University of Toronto
Projit Bihari Mukharji, Ashoka University
John Paul Gutierrez, History of Science Society
Suman Seth, Cornell University

002. Registration Day 1
11:00 to 6:00 pm - Thursday 13 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon Registration Desk

003. The Compassionate Gatekeepers: Increasing the Number of The Underrepresented in STEM Fields
Organized Session
12:00 to 1:30 pm - Thursday 13 Nov.
Sheraton New Orleans: Napoleon A1
The Compassionate Gatekeepers, highlights the critical role of committed and compassionate STEM faculty who were institutional leaders and intentionally fostered supportive environments for the underrepresented in STEM fields in postsecondary communities. Collectively, this session will offer research-informed insights, practitioner strategies and pedagogies, and a compelling call to action for institutional leaders to support and elevate the work of compassionate gatekeepers across all STEM fields.
Participants:

The Issues: A Historical Perspective *Ron Mickens, Clark Atlanta University*
The Issues will provide a historical overview of the Underrepresented in STEM disciplines. The presentation will explore how both barriers and opportunities have impacted the progress of the Underrepresented in STEM.

The Compassionate Gatekeepers *Albert Thompson, Spelman College; Isom Herron, RPI*
The Compassionate Gatekeepers introduces a framework to define and recognize scientists, engineers, and mathematicians who serve as “gatekeepers.” This session will delve into defining what gatekeepers are, what gatekeepers do, why they engage in their practices, and their goals.

A Compassionate Gatekeeper: Dr. Melvin Webb *Shari Watkins, American University; Melvin Webb, Clark Atlanta University*
A Compassionate Gatekeeper: Dr. Melvin Webb provides a focused case study of the PRISM-D (a STEM academic training program for BS/MS degree) Program at Clark Atlanta University. Founded and led by Dr. Webb, the PRISM-D is a powerful exemplar of how a intentional, research-centered academic training program, and culturally responsive mentorship can significantly impact student retention and achievement in STEM.

Session Organizer:
Shari Watkins, American University
Chair:
Shari Watkins, American University

004. Translations of Science in Imperial East Asia
Contributed Paper Session
12:00 to 1:30 pm - Thursday 13 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon A2
Participants:

Transmission of British Engineering Geometry: From State Arsenals to Imperial Tombs in Late Qing China (1875–1878) *Zhaoyi Ma*
This study examines how British descriptive geometry—a cornerstone of industrial technocracy—was adapted in late Qing modernization (1875–1878), challenging Eurocentric narratives of

knowledge diffusion. Analyzing engineering translations and architectural drawings, it reveals how Qing actors reimagined Newtonian-Cartesian spatial concepts through strategic synthesis. Focusing on the Self-Strengthening Movement, the study contrasts two sites: (1)Jiangnan Arsenal: Missionary-Han collaborations translated texts like Qixiang Xianzhen (1872), hybridizing Cartesian coordinates with xiang (象, cosmic manifestation) to create tuxue (图学, technical diagrams) for militarized production. (2)Yangshi Lei Architects: Tongzhi Mausoleum blueprints fused British projection with dipanyang (地盘样, geomantic plans) and jiehua (界画, ruled-line painting), embedding precision within embodied experience. The study's comparative analysis uncovers stratified knowledge hierarchies: (1) Han literati elevated geometry to ti (体, cosmological essence), aligning it with Confucian gewu zhizhi (格物致知). (2) Manchu-supervised craftsmen reduced it to yong (用, managerial tools), using military projection for bureaucratic control while preserving its module construction system. The findings reframe the Self-Strengthening Movement as a spatial-epistemic negotiation—not imitation but tactical indigenization. Qing actors decoupled industrial techniques from Eurocentric roots, repurposing descriptive geometry as the facilitation for imperial engineering.

Pharmaceutical Science across Borders: Knowledge Circulation between Japan and China, 1900s-1930s ***Yaming You, Duke University***

This paper looks at the historical development of laboratory experiments and chemical analyses of traditional Chinese medicinal drugs in early twentieth century China. More specifically, it looks at the introduction of the concept "active pharmaceutical ingredient" into China. Identification and extraction of active ingredients came to dominate the study and usage of traditional Chinese medicinal drugs in this era. This change in pharmaceutical practice was a collective effort by many Western- and Japan-trained pharmacists and chemists in the twentieth century. This paper chooses to focus on Zhao Yuhuang, the leading figure in the development of pharmacognosy (a branch of pharmacy that studies medicinal drugs derived from botanical or other natural sources) and modern bencao study (classical Chinese materia medica) in twentieth century China. Zhao graduated from the Imperial University of Tokyo in Japan under the guidance of the Japanese pharmacologist Shimoyama Junichiro and introduced the subject of pharmacognosy to China, including one of its basic principles of "active ingredient." The paper argues that the concept of "active ingredient" replaced traditional pharmacological principles like "sovereign, minister, assistant, and courier" (jun chen zuo shi 君臣佐使) and "ascending, descending, floating, and sinking" (sheng jiang fu chen 升降浮沉), and made possible the scientization project for traditional Chinese medicinal drugs. Apropos of the epistemological change, traditional Chinese medicinal plants were rendered lifeless objects for laboratory research, completely detached from the previously holistic approach to traditional medicine formula (yaofang 药方).

Reckoning with Modernity: The Pedagogy and Historiography of Mathematics in Early Twentieth-Century Japan ***Yu Shan Chen, Harvard University***

How should Japanese pupils learn to count, calculate, and reason as part of modern society? With a rapid transition to Western mathematics and overhauling the arithmetic curriculum, scholars from the late 19th century struggled to reform how the nation learned and practiced mathematics. Early experiments with Pestalozzian teaching methods yielded mixed results in the enlightenment project of Meiji-era Japan (1868~1912), as pen-and-paper calculations failed to meet computational demands as students reverted to the abacus. In response, mathematics educators and historians such as Ogura Kinnosuke (1885~1962) and Fujisawa Rikitaro (1861~1933) created

pedagogies that grounded national math curriculums in their understanding of what divided “feudal” math from “contemporary” practice, guided by their political visions for modernity. At the same time, the historiography of science in Japan got started by examining early modern mathematical achievements (e.g., accurate calculation of pi and a version of calculus before Leibniz and Newton), projecting the image of a prescient nation misguided by a lack of scientific methodologies. On the other hand, under the influence of Taylorism and applied psychology, abacus educators in early twentieth-century Japan industrialized early modern arithmetic by shaping human computers that personified numeracy fit for a new era. This paper explores the visions for mathematical modernity in Japan before WWII and what it meant to reckon in the modern age.

005. Radiating Sciences

Contributed Paper Session

12:00 to 1:30 pm - Thursday 13 Nov.

Sheraton New Orleans: Floor 3rd Floor - Napoleon A3

Participants:

Thinking with Things: Coining Radioactivity as Property of Matter (1896) ***Samira Daneshvar***

This paper examines the detection of radioactivity as a property of matter at the turn of the twentieth century. Experimentation with phosphorescent materials led the nineteenth-century French scientist Henri Antoine Becquerel to identify radioactivity as a phenomenon distinct from phosphorescence and inherent to certain elements, such as uranium. Indifferent to solar excitations—which are necessary for the luminosity radiated from phosphorescent matter— uranium, Becquerel discovered, emits radiation even in the dark. Unlike phosphorescence, this radiation could penetrate thick black paper and metal sheets, making impressions on photographic plates. As such, the discovery of radioactivity was linked to scientific visualization and the production of shadow pictures. In making shadowgraphs, Becquerel subjected everyday objects to uranium rays very early in his experiments, the earliest of which was a coin (pièce de monnaie). While the shadow picture of a copper cross historically signifies Becquerel’s discovery of spontaneous radiation, the shadow picture of an aluminum coin is the first ordinary object that he irradiated as his regular reports to the Academy of Science Meetings documents. The radiograph of the coin—which is yet to be recovered from the still-radioactive archives—is significant for its replacement by a shadow picture of a medal (médaille), possibly of Louis XV, which appears in Becquerel’s 1903 monograph. By examining the transformation of ordinary things into wonders of scientific inquiry, I discuss how shedding “new” light on familiar objects turned them into catalyzers of scientific thought, freed from the scrutiny of existing scientific axioms. This paper will analyze the material and cultural significance of a coin as a site of scientific experimentation. Serving as an example, Becquerel’s experiments provide a case for contextualizing ordinary objects employed in sciences within the broader field of object ontology.

Reanimating Radiesthesia: Efforts to Resuscitate the Legitimacy of a Dubious Science in Early Twentieth-Century Turkey ***Meric Tanik, Columbia University***

How do sciences fall into disrepute, decline, and disappear, and what strategies do their advocates use to keep them alive? This paper addresses these questions through the lens of radiesthesia—now widely dismissed as pseudoscience—drawing on the previously unexplored archives of Samuel Abravanel Aysoy (1885-1959). A celebrated veterinary professor trained at France’s prestigious École vétérinaire d’Alfort, Aysoy leveraged his academic standing to bolster radiesthesia’s credibility despite intense scepticism. He played a pivotal role in building a transnational network of radiesthesists across Europe—particularly

in the UK, Belgium, France, and Germany—by founding associations, establishing journals, and organising congresses, all aimed at creating a simulacrum of a legitimate scientific community. Aysoy's strategies were double-pronged: as a Turkish dowser, he served as an example to European believers in radiesthesia by demonstrating its universal applicability beyond the Old Continent, while simultaneously he leveraged the support of his European colleagues to bolster radiesthesia's credibility back home. As a practitioner, Aysoy also developed a novel device called the "radio-amplifier," designed to mitigate the methodological pitfall of "autosuggestion," thus reframing radiesthesia as more empirically robust. By analysing the strategies Aysoy employed, this paper reveals how a science teetering on the edge of respectability can seek to legitimise itself. It offers insights into broader processes by which fringe sciences endeavour to forestall their "end," illuminating the interplay among rhetorical tactics, professional networks, and technological innovation in reshaping the ever-fluid boundaries of scientific authority.

Information Collection and Technology Transfer: The Chinese Communist Party's Cryptography, 1927–1945 ***Zhongtian Han***

This paper analyzes how the Chinese Communist Party's information collection efforts enabled it to advance its proficiency in cryptography in 1927–1945. While the Party had adopted a systematic cover words system for its secret communications since its founding in 1921, the introduction of radio technology in 1927–1928 brought the challenge for the Party to adapt its cryptography to the infrastructure of radio telegraphy. The Party thus strived to collect codebooks and other cryptographic materials from the Nationalist government through human agents and battlefield capture. Based on learning from the Nationalists, it developed a two-layer cryptographic system that employed both enhanced codebooks and additive keys from 1927 to 1936. During the Sino-Japanese War of 1937–1945, the Party further improved its cryptography by capturing and learning from Japanese cryptographic materials. And its strengths in cryptography were recognized by Japanese codebreakers. My paper challenges previous interpretations of the technology transfer of the Chinese Communist Party that emphasize the Party's incorporation of Nationalist and Japanese technicians in state-building efforts after 1949. Putting Communist archives into dialogue with Nationalist and Japanese archives, it shows how information collection efforts had contributed to technology transfer from the state to the revolutionary movement since 1927. Furthermore, while past scholarships emphasize the lack of information accessibility as an obstacle to technology transfer, my research shows how effective information collection efforts could help to overcome this barrier.

006. Origins and Narratives in the History of Science

Contributed Paper Session
12:00 to 1:30 pm - Thursday 13 Nov.
Sheraton New Orleans: Napoleon B1
Participants:

Settler Paleontology, Archaeology, and the Rise of American Environmentalism ***Ali Mirza, Amherst College***

This paper presents new historical and archival research on the nineteenth century discovery of fossil footprints in the Connecticut River Valley. It has unanimously been held that the fossil footprints were reconstructed based on Cuvierian zoological principles stating that animal morphology is essentially static or rigid—the bird-like footprints, accordingly, indicating ancient bird-anatomies. I reveal here, however, that local naturalists such as the president of Amherst College, Edward Hitchcock, considered these creatures to be more discordant than we have appreciated, more like Gorgons or Chimeras in form than modern-day birds. Hitchcock, notably, came to believe that these creatures rather than migrating had

internal powers of adaptation allowing them to survive in novel environments. This served as crucial evidence that the aspiration of settler societies to “go-Native” in new locales had natural historical precedent. This even led Hitchcock in the 1850s to accept the transmutation of morphological forms without committing himself—negatively or positively—to claims about common descent. This paper explores how the resulting “settler zoology” altered New Englander understandings of the relationship between humanity and the environment. It reveals, for instance, why in Amherst placing footprints next to ancient Assyrian sculptures looted from the Palace of Ashurnasirpal II so rapidly stimulated conversations, from the 1850s to the 1870s, regarding the possibility of zoological adaptation and ecological transmutation. This, in turn, allows us for the first time to track how pairing footprints and ancient Assyrian reliefs served as the impetus for critical elements within Emily Dickinson’s environmentalism.

Taphonomy Turned Inward: Recovering the Human Trace in the Fossil Data Archive ***Nicholas Hoffman, Neotoma Paleoecology Database***

The Quaternary archive - constituted by the totality of recent fossil specimens and the data derived from them - provides the raw materials with which paleobiologists generate new insights into the nature of past worlds. But it also records paleobiology’s disciplinary history, shedding light on the tacit ideologies and assumptions, the working environments, and the political economic conditions which have nurtured the science. I historicize this fossil data archive by telling the story of vertebrate faunal data collected from expropriated native lands of Missouri River country between 1946 and 1967 by Smithsonian archaeologists, rearticulated from 1980 to 1995 by an emergent group of scientific practitioners - paleoinformaticians - and aggregated in 2006 into the Neotoma Paleoecology Database, an important modern resource for paleobiologists which services thousands of data requests every day. The rearticulation of these data made them easier to use, and easier to misuse, by stripping away their context. In particular, the expropriation of Native land which enabled data collection, and the paradigms which guided scientists as well as their techniques of excavation and analysis, are not well represented in Neotoma, allowing users to mistakenly assume that the data reflect a trans-historical truth. Databases have histories, and these histories urge vigilance: users must question the givenness of their data. Neotoma’s history is a history of the relationship between scientists, the state, and Indigenous communities, and the evolution of paleobiological thought within that nexus.

Toward a Bigger "Big History" -- of Science and Culture ***James Rodger Fleming, Colby College***

Big History presents a comprehensive narrative of the universe, tracing its evolution from the Big Bang to the present. While offering a broad, interdisciplinary perspective, it ultimately centers on a single planet inhabited by a self-conscious species—us—placing Earth and human concerns at the heart of the story. In this sense, it represents a modern form of geocentrism. The Big History Project, spearheaded by David Christian and Bill Gates, briefly surveys traditional origin stories, primarily to contrast them with and evaluate them against the modern scientific account. In its pursuit of interdisciplinary synthesis, Big History requires the historian to take on the roles of amateur astronomer, geologist, and archaeologist, shifting the focus from human history to the inanimate world. However, it largely overlooks the historical development of the sciences and their evolving claims to knowledge. Given that the Big Bang theory emerged in 1965, the current (21st-century) version of Big History is not the only possible interpretation. Rather than simply critiquing this contested genre, this presentation explores whether a "bigger" Big History of science and culture is possible—one that

incorporates insights from past grand narratives or reimagines what a Big History text might have looked like in different eras. How would such a narrative have been framed in 1923 (without quantum mechanics and atomic structure)? In 1858 (before Darwinian evolution and germ theory)? Or in 1542 (shaped by Ptolemaic astronomy, alchemy, and biblical providence)? Finally, this discussion considers the strengths of Big History as highlighted by its advocates.

Knowledge in Motion: Rethinking Scientific Historiography in Mexico from the Local ***Mariana Espejo***

This project proposes a critical reassessment of the history of science in Mexico by analyzing canonical works of national historiography in dialogue with Joseph Needham's theory of knowledge circulation. Through the examination of foundational texts by authors such as Justo Sierra, Edmundo O'Gorman, Leopoldo Zea, Antonio Caso, José Gaos, and Luis Villoro, the research explores how science and technology were represented in the intellectual construction of the Mexican national project. It highlights the tensions between nationalist narratives and foreign influences, as well as the absence of a transnational perspective on scientific and technical knowledge flows. Moving beyond traditional frameworks that depict Mexico as a passive periphery, this project embraces Needham's view of science as a dynamic process of circulation, appropriation, and cultural re-signification. Drawing from this approach, I aim to reflect on how a new narrative of knowledge history in Mexico might be built—not as a mere recipient of external ideas, but as a site of active, localized production and transformation of knowledge. This philosophical and historiographical revision opens the possibility of crafting a situated intellectual history, one that challenges core-periphery binaries, diffusionism, and Eurocentrism. By fostering dialogue among historiography, philosophy, and science and technology studies, the project proposes a renewed analytical framework to understand how knowledge circulates, is reconfigured, and becomes meaningful within specific historical and cultural contexts.

007. Beauty, Love, and Hygiene

Contributed Paper Session

12:00 to 1:30 pm - Thursday 13 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon B2

Participants:

"Being Beautiful is a Duty": Popular Discourses of Body Weight in Argentina, 1930s-1950s ***Suzanne Rubinstein, University of Wisconsin–Madison***

This paper explores how popular magazines discussed ideas of body weight from the 1930s-1950s in Buenos Aires, Argentina. Specifically, this paper examines perceptions of obesity and weight gain, and weight loss methods and products, as they appeared in these types of understudied materials. I argue that between the mid-1930s through the mid-1950s, magazine writers, advertisers, and physicians increasingly promoted ideals of thinness and svelteness as healthy, normal, and beautiful, particularly for the bodies of Argentine women, by way of popular publications. Through images, advertisements, and articles, these historical actors furthered the idea that a slender body was an ostensibly modern body, and one that could meet the challenges of political, economic, and social change in Buenos Aires. There remained an undercurrent of morality regarding the difference between thin/svelte bodies and obese/fat bodies - popular magazines furthered the idea that being thin was more morally upright than being obese. I examine the relationships between body weight and beauty, and race, class, and gender. Although my focus centers on popular discourse, my work reveals how ideas on weight in contemporary magazines remained in dialogue with those presented in medical journals. This paper reinterprets prior periodizations of weight loss and obesity in

popular publications by demonstrating how these topics appeared decades earlier in the literature than previously studied. Lastly, this paper analyzes how perceptions of weight and corporeality reflected the desire to be seen as modern and cosmopolitan on an international stage, particularly in the eyes of Western Europeans and North Americans.

Love Doctors: Paul Popenoe, Margaret Sanger, and the Creation of Eugenic Love
Abigail Grace Cramer, Carnegie Mellon University

First published in 1926, the marriage manual Happiness in Marriage declared that “happiness in marriage is not a matter of chance. It is a growth. Like all other living and growing organisms, it must first germinate, then strike root and then, after careful tending and cultivation, be brought to maturity. Only thus may it bloom and bear fruit” (14). While she is known far more for her work advocating birth control, the author of this manual was none other than Margaret Sanger. Using explicit eugenic language of cultivation, Sanger viewed love marriages as a way to eugenically propagate the white race, and she was not alone. Eugenics, or the science of “better breeding” inherently necessitated the marriage and reproduction of the so-called “right kind” of people. Yet, by the 1920’s, this focus on marriage escalated and transformed into an overt focus on romantic and sexual love through the work of Margaret Sanger, Paul Popenoe, and others. Through Popenoe and Sanger’s various publications on love and marriage, the creation of Popenoe’s American Institute of Family Relations in 1930, and his later reputation as “Mr. Marriage,” the two eugenicists placed love as a central tenet of the eugenic ideal. I argue that the centrality of love to eugenics operated as a guise for eugenicists to continue their influence into the postwar period, and even today. With compulsory heterosexuality and pronatalism on the rise, this presentation seeks to place these developments into their long historical contexts.

Beauty is the Only Skin-Deep?: Visible Health and Defining “Skin Hygiene” in the South Korean Cosmetic Industry
Byeongwoong Min

This research examines how South Korea`s cosmetic industry tried to combine the ideals of health and beauty under the concept of “skin hygiene” through door-to-door cosmetic sales between the 1970s and 1990s. Focusing on Pacific Chemical—now known as AmorePacific, a leading beauty company—this paper asks: what did “skin hygiene” signify in the context of late twentieth-century South Korea? How did its meaning evolved over time? Drawing on company magazines, publications by industry professionals, and staff training materials, the author argues that Pacific Chemical advocated a skin-centric view of health, equating clean, beautiful skin with overall wellness. I show in detail how the corporation organized makeup practice courses targeting young cosmetic users and training programs for sales representatives to promote their products. These courses and training sessions emphasized not only the physical structure of the skin and its ideal condition but also promoted skincare routines as essential for maintaining both health and beauty. Pacific Chemical’s conception of skin hygiene, as this paper demonstrates, encompassed balanced skin care through facial massage, diet, rest, and even mental well-being. In this framework, the skin was not merely an external organ reflecting internal health, but a visible site where health itself was manifested. By highlighting the role of cosmetic salesperson and the beauty industry—figures often overlooked in East Asian historiography of medicine, which tends to focus on authoritarian states and public area—this study uncovers a critical thread in the history of dermatology’s commercialization in contemporary South Korea.

008. Botany and Horticulture in Britain and the Americas

Contributed Paper Session
12:00 to 1:30 pm - Thursday 13 Nov.
Sheraton New Orleans: Napoleon B3
Participants:

Men of Ancient Simplicity: The Aesthetics of Epic Retreat in Seventeenth-Century Botanical Enquiry *Bethany Kidd, UCL*

In a 1660 letter to Sir Thomas Browne, the horticulturalist and future Royal Society fellow John Evelyn described his design for a “philosophical garden.” It should feature, he wrote, statues of “Hortulan Saints”—“persons of Antient Simplicity.” What, exactly, was a “Hortulan Saint”? And what did Evelyn understand by “Antient Simplicity”? This paper examines how the trope of the “happy man” of classical Roman literature was used to dignify natural philosophical inquiry into traditionally domestic spheres, particularly in the writings of Evelyn, Abraham Cowley, and John Beale. The happy man was typically a figure of retreat in classical epic: an alternative to the demands of civic and martial glory. He is exemplified by figures such as Cincinnatus, a man reluctantly recalled from his rural retirement to serve as dictator of Rome during a national crisis. The generic proximity of the “happy man” to classical epic heroism made the trope particularly attractive to the "Moderns" in the context of the Ancients and Moderns debate, aligning activities like tending a vegetable garden with the virtues of ancient leadership. This association helped deflect the mock-heroic satire aimed at Evelyn and Martin Lister. The paper also explores how the ideal of “Ancient Simplicity” shaped the norms and aesthetics of native plant collection during the 1660s and 1670s. This is most vividly illustrated in biographical accounts of the plant collector Thomas Willisel, a former impoverished foot soldier in Cromwell’s army, whose austere diet, dress, and comportment exemplified John Ray’s vision of an ascetic, “Pythagorean” science.

Colonial Botany and the Craft Tradition: Charles Plumier’s Architectural Analysis of Caribbean Flora *Jordan Kellman, University of Louisiana at Lafayette*

This paper explores the intersection of architectural and botanical theory in the work of the seventeenth-century French Caribbean explorer Charles Plumier. It builds on recent work focusing on craft traditions and practices and their importance to the Scientific Revolution generally and to the generation of knowledge in early spaces of colonial exchange in particular, reexamining the Zilsel thesis in colonial context. Using manuscript sources, some previously unknown, of Plumier’s work in architecture and lathe turning, it situates Plumier’s transformational botanical works from three voyages to the Antilles: Description des Plantes de l’Amérique (Paris, 1693); Nova plantarum americanarum genera (1703); and Traité des Fougères (1705) within the context of his craft knowledge and practice. Together these works established much of Europeans’ contemporary knowledge of Caribbean flora, but I focus on his treatise on ferns, showing how his choices of botanical subject matter, taxonomic methods, and techniques of illustration all drew on his architectural technique and woodcraft. The same craft experience shaped Plumier’s interpretation of indigenous botanical knowledge as he sought to reframe local understanding of plants into scientifically accepted and profitable knowledge for metropolitan consumption.

Imperial Policy and Local Needs: Colonial Botanic Gardens and Debates about Preserving Trees in the British Empire *J'Nese Williams, Wake Forest University*

In the late eighteenth and early nineteenth centuries, British officials founded about a dozen botanic gardens on colonial territory in India and the Caribbean. Botanic gardens were thought to be an effective strategy for increasing agricultural yields and surveying the empire’s plant life for new medicines and otherwise

economically valuable species. Scholars have argued that this type of development or “improvement” of colonial land was a common justification for British rule. Elite scientific boosters, like Sir Joseph Banks, supported the gardens and believed that their imperial function and their potential for adding to the body of botanical knowledge were interlinked goals. Besides these official functions, the superintendents in charge of these gardens quickly became involved with efforts to conserve specific plants, particularly trees, in the empire. Enlisting garden superintendents along with other imperial officials and sometimes local elites, the conservation initiatives used strategies from government plantations to official reserves, to laws restricting harvesting, each of which reflected particular attitudes about governance, the governed, and private property. Conservation efforts sparked debates about the purpose of conservation, the proper role of imperial government, and the possible dangers of intervention. This paper uses these debates to help historicize the multiple meanings of conservation and reveal the limits of imperial policy.

‘Fruits of the Future’: The Minnesota State Horticultural Society's Experiments with Russian Apples, 1880-1900 ***Kathryn Bruce, University of St Andrews, Linda Hall Library***

In her book, Apple: A Global History (2011), Erika Janik argued that the apple ‘travelled the globe and… did such a convincing job at making itself at home in America that many Americans wrongly assume the fruit is native.’ A product of ecological imperialism, (Crosby, 2000), the apple has long been part of the national myth of America, linked to ‘pioneers’ such as Johnny ‘Appleseed’ Chapman and Henderson Luelling. However, the ‘old world’ varieties of apples which flourished on the East Coast of the United States struggled to make themselves ‘at home’ in North America’s colder regions. This paper examines the pan-North American efforts by fruitgrowers, scientists, and the United States Department of Agriculture to develop cold-hardy varieties of apples which could survive the winters of the cold north through a case study of the Minnesota State Horticultural Society (MSHS) and their experiments with Russian varieties of apples. Scions, seedlings, and knowledge about Russian horticulture (and its application in Minnesota), were frequently exchanged at the MSHS meetings and through the visits of members to the orchards of their peers during this time. This paper will argue that work of this community of growers, described by the Minnesota Landscape Arboretum’s website as ‘horticultural enthusiasts’, was actually characterised by collaborative widespread, organized, and systematic hybridization and breeding experiments. In doing so, the paper will shed light on how we can better understand the relationship between North American science, horticulture, and the global networks of the people involved.

009. GECC Welcome Room Day 1

12:00 to 5:00 pm - Thursday 13 Nov.
Sheraton New Orleans: Floor 3rd Floor - Poydras

010. HSS Council Meeting

Business Meeting
1:00 to 5:00 pm - Thursday 13 Nov.
Sheraton New Orleans: Floor 3rd Floor - Borgne
Participants:

Elena Aronova, University of California, Santa Barbara
Adrianna Link, American Philosophical Society
Mackenzie Anne Cooley, Hamilton College
Elise K Burton, University of Toronto
Patrick McCray, University of California, Santa Barbara
Jia-Chen Fu, Institute of Modern History, Academia Sinica
Asif Siddiqi, Fordham University
Samantha Muka, Stevens Institute of Technology
Prakash Kumar, Pennsylvania State University
Jahnavi Phalkey
Omar Nasim, University of Regensburg
Maria Rentetzi

Pratik Chakrabarti, University of Houston
Jessica Wang, University of British Columbia
Elizabeth Yale, University of Iowa
Evelynn Hammonds, Harvard University
Soraya de Chadarevian, University of California, Los Angeles
Matthew Shindell, Smithsonian National Air and Space Museum
Emily Hamilton, University of Massachusetts, Amherst
Projit Bihari Mukharji, Ashoka University
John Paul Gutierrez, History of Science Society
Fa-ti Fan, Binghamton University
Patrícia Martins Marcos, University of Oklahoma
Charlotte Abney Salomon, Science History Institute
Michael J. Barany, University of Edinburgh
Clare Kim, University of Illinois at Chicago
Donald L. Opitz, DePaul University
Christina Ramos, Washington University in St Louis
Suman Seth, Cornell University
Sarah Qidwai, University of York

011. Animals and the Making of Modern Science: Experimentation, Empire, and the State

Organized Session
2:00 to 3:30 pm - Thursday 13 Nov.
Sheraton New Orleans: Napoleon A1

This panel explores the central role of animals in the making of modern science, medicine, and governance during the nineteenth and early twentieth centuries. Spanning British, French, and American contexts, the papers examine how animals were not only displayed, studied, and managed, but also instrumentalized in the production of knowledge and governmental authority. From the circulation of “duplicate” specimens in imperial menageries to experimental research on infectious disease in Parisian zoos, and the rise of agricultural science within the U.S. federal bureaucracy, the panel traces how animals became both subjects and instruments of inquiry, situated at the intersection of spectacle, science, and state power. Together, the papers reveal how zoological and agricultural institutions transformed living creatures into tools of scientific advancement and mechanisms of administrative control, shaping understandings of disease, reproduction, and economic life. Attending to the institutions, debates, and practices that structured animal experimentation and management, the panel illuminates the varied and contested roles animals played in the development of scientific knowledge, medical authority, and modern governance.

Participants:

Breeding Empire: Menageries and the Duplication of Animal Life *Alexander Clayton, University of Vermont*

Menageries were a brutally inefficient business. Death and disfigurement dominated the history of zoological displays throughout the nineteenth century, crafting a cyclical industry that rested on capture, death, and replacement. My paper explores the shifting virtues of animal breeding throughout the nineteenth century, tracing how British menageries attached political, scientific, and financial significance to their largely unsuccessful reproduction efforts. For naturalists, breeding offered new insights into animal behavior and provided dissectible specimens untouched by the violence of capture. For politicians, reproduction highlighted the possibilities of acclimatization and the feasibility of colonial rule. While for menagerie owners, animal breeding solved an economic problem far more than it solved a conservationist one, stocking collections with “duplicates” that might be sold and traded for variety. Even as scientific institutions such as the Zoological Society of London boasted increasingly sustainable breeding programs, those duplicates were more often exchanged to acquire captured novelties from commercial dealers such as P.T. Barnum and Carl Hagenbeck. By the end of the nineteenth century, fears of extinction only heightened this demand for the rarest specimens, furthering extraction rather than conservation. This nineteenth century history reveals how animal duplication sustained all aspects of the extractive animal trade, forming just one part of an

increasingly organized system of breeding, capture, and replacement. By tracing these varied and often competing aspirations, it is possible to uncover the growth of an insular and self-sustaining network that continues to shape zoological breeding and exchange today.

Contagion and Controversy: Animal Experiments and Infectious Disease Research at Paris Zoos ***Claire Cage, University of South Alabama***

In nineteenth-century Paris, the city's two zoological gardens—the Jardin des Plantes menagerie and the Jardin d'Acclimatation—served not only as public spectacles but also as key sites of experimental inquiry into infectious disease. At a time when French physiology and medicine increasingly embraced empirical methods and live animal experimentation, these institutions provided access to diverse species for investigating disease processes and interspecies transmission. This paper examines how medical, veterinary, and scientific researchers transformed these zoological collections into living laboratories, focusing on three revealing episodes involving syphilis inoculation, tuberculosis transmission, and a deadly outbreak of rinderpest. These cases provoked intense debate over experimental technique, species comparability, and the evidentiary status of pathological findings. At the same time, the zoos themselves emerged as sites of risk: places where disease was not only studied but also cultivated and spread. By tracing these controversies, the paper shows how animal experimentation at Parisian zoos advanced medical knowledge, challenged prevailing assumptions about species boundaries, and helped reshape the experimental foundations of medical authority in nineteenth-century France.

The Progressive Animal: Agricultural Science, the State, and the Making of Modern Animal Life ***Oliver Lazarus, Harvard University***

In the late nineteenth century, the American federal government created the Bureau of Animal Industry within the Department of Agriculture, representing a novel experiment in federal bureaucracy that fused scientific expertise with, for the first time, the power to manage health and regulate economic activity that crossed state lines. While the BAI's work has largely been examined for its attempts to manage animal disease, this was just one element of the BAI's mission, which, by the first decade of the twentieth century, expanded to encompass nearly every aspect of the study, production, and management of domestic animal life both within, and eventually beyond, U.S. borders. BAI officials ran research farms throughout the country in which scientists conducted experiments on populations of animals in the tens of thousands, disseminated literature to the American public on the proper utilization of and relationship with nonhuman life, and tested new nutritional, management, and breeding techniques to optimize "animal industry" in a period of industrialization. Blurring the boundaries between research and governance, the BAI became a scientific and administrative authority over living systems. This paper examines the BAI's transformation from a disease-control agency into a central node in the federal infrastructure of agricultural science, representing the largest federal commitment to scientific research in the first half of the twentieth century. These efforts positioned animals as experimental subjects for a range of processes, from commodification—through the simultaneously shaping of farmed animal bodies and habits of consumer consumption—to the federal government's support for the life sciences more broadly. By analyzing the BAI as a case study in the co-production of scientific knowledge and governmental authority, this paper argues that the state-led attempt to experiment with domestic animals was inseparable from the expansion of state power in the Progressive era.

Session Organizer:

Claire Cage, University of South Alabama

Chair:

Daniel Vandersommers, University of Dayton

Commentator:

Daniel Vandersommers, University of Dayton

012. What's Proof Got to do with it? Benefits of the Doubt in Environmental Science and Policy

Organized Session

2:00 to 3:30 pm - Thursday 13 Nov.

Sheraton New Orleans: Floor 3rd Floor - Napoleon A2

In theory, environmental policymaking relies on scientific evidence. Who produces that evidence, the standards of proof required, and the responsibility for potential harms varies considerably across issues, time, and place. Environmental policy disputes are often marked by a high degree of controversy. Science can rarely be expected to end disputes by establishing definitive proof of risk or its absence; certain parties will inevitably bear the burden of proof for establishing riskiness, and others will be accorded the benefit of the doubt. This panel examines a set of questions related to scientific knowledge, environmental risk, and policy. These include: In the face of scientific uncertainty, whose interests are prioritized, and whose have been put at risk? Who has been given the benefit of the doubt, and who has been given the burden of proof—and does that make sense epistemically, ethically, or legally? To what extent have evidentiary burdens been influenced by the very industries who produce the risks in question? The papers examine how standards of evidence were formed for predicting earthquake destruction since the early 1900s; how fisheries science and management developed in the 1940s-50s assumed fish populations were resilient despite evidence to the contrary; and how U.S. regulators negotiated their reliance on corporate toxicity data in the 1970s. The panel aims to generate discussion about how expertise is used in managing environmental risk; whose expertise is deferred to and why; how different forms of evidence have been mobilized; what degree of consensus or conclusivity is required; who is responsible if things go wrong.

Participants:

Who is Responsible for Predicting Earthquake Destruction? Epistemological and Legal Burdens of Proof for Seismic Prediction ***Ana Luiza Nicolae, Harvard University***

On April 6th 2009, a 5.9 Richter magnitude earthquake struck the Italian town of L'Aquila, killing 308 people. A few days earlier, scientists reassured locals that the smaller earthquakes they had recently been experiencing would lead to no greater risk of a larger quake. In 2012, six scientists were convicted on multiple manslaughter charges for giving "inexact, incomplete and contradictory" guidance preceding the April 6 earthquake. All officials involved were later cleared of charges. The case hinged on an alleged indeterminacy within the field of seismology: do many small earthquakes increase or decrease the chance of a big one in the future? This case parallels one a century prior. In 1902, Governor of Martinique Louis Mouttet refused to order the evacuation of 30,000 residents of the capital, St-Pierre, after witnessing several weeks of ash, fire and rubble ejections from the island's volcano, Mont Pelée. On May 8th, an eruption took the life of every resident within seconds. Some historians have vindicated Mouttet, citing the lack of scientific volcanology at the time as an impediment to making a more risk-averse decision. In both cases, the indeterminacy attributed to precursor signs of disaster proved redeeming for scientists and decision-makers. Historical allocation of benefit of the doubt in earth-related natural disasters has set important precedents and boundaries for modern seismological issues. More recently, water-disposal activities in a range of industrial applications have been inducing seismic activity, inspiring legislation and regulation that continues this conversation about the burden of proof. This presentation historicizes the relative burdens of proof assigned to seismic experts as well as water-injection operators in the event of natural and artificial earthquakes.

"Proof that Seeks to Modify the Ways of Commerce…Must be Overwhelming":

Why we Presume there are Always More Fish in the Sea *Aaron Van Neste, Oberlin College*

In fisheries science, the burden of proof has historically fallen on those who would claim a fishery is depleted or a fishing practice is unsustainable. In the words of British fisheries conservation pioneer Michael Graham, “the onus for showing that any regulation of fisheries is necessary lies upon those who would advocate it… the idea of regulation to prevent over-fishing before it occurs is not acceptable.” This asymmetrical burden of proof was formalized in the 1940s-1950s as fisheries science developed. Mainstream fishery science requires initial overfishing. Maximum sustainable yield (MSY, or the amount of fish which can be caught without reducing future years’ catch) has been used by fisheries scientists and managers since the 1940s for setting catch targets and quotas, and is still used as a key metric for calculating when a fishery is overfished. But to calculate MSY, a fishery’s catch must first exceed it; once scientists are aware of a decline in catch indicating the population is no longer able to reproduce at a maximum level, quotas can be reduced until the population recovers. The theory goes that fish populations are resilient and can respond easily to overfishing. In practice they are not - something which has been observed since the late 1940s collapse of the California sardine and subsequent quotas failed to restore the fishery. A historical analysis of evidence used to support the assumption of resilience finds minimal data, distorted graphs, and a heavy reliance on theories about the “balance of nature.” Even though numerous stocks from Grand Banks cod to orange roughy have failed to bounce back easily, MSY (and the requisite overfishing it implies) is still scientifically and legally enshrined.

A “Breach of Faith”: Chemical Regulation, Corporate Data, and the Benefit of the Doubt *Colleen Lanier-Christensen, Harvard University*

Since the advent of U.S. testing laws in the early 20th century, decisions about chemical safety have been based on industry-generated data, with little oversight. How did regulators know that the data were an unbiased reflection of careful laboratory study? They didn’t. Regulators gave industry the benefit of the doubt, despite their obvious profit motive and sometimes in the face of overwhelming evidence to the contrary. This talk examines 1970s U.S. Food and Drug Administration (FDA) and Environmental Protection Agency (EPA) investigations that uncovered evidence that pharmaceutical and chemical companies had submitted fraudulent toxicity data. Until this time, agencies took corporate data “on faith.” But even when this faith was breached, regulators were loath to admit that there could be malfeasance, or even incompetence. Why? From both a legal and epistemic standpoint, there is no reason a corporation with a new drug or chemical should be given the benefit of the doubt—quite the opposite. Then why were they? I demonstrate that maintaining skepticism of industry-generated data would have made it impossible for regulators to do their jobs. Unless the system was remade around third-party testing—which was never seriously considered—regulators at some level had to trust the data they received from manufacturers. Desperate for an approach to make the problem at hand manageable and justify the continued private production of data, the FDA and EPA developed regulations called Good Laboratory Practices to standardize and bureaucratize toxicity testing. The rules—emblematic of larger shifts towards demands for accountability through standardized metrics, procedures, and documentation—promised to enable regulators to govern without reforming the system. However, government reliance on these standards has ultimately reinforced the privileged position of corporate data and continued to assign the benefit of the

doubt to industry.

Session Organizer:

Aaron Van Neste, Oberlin College

Chair:

Frederick R. Davis, Purdue University

013. Bureaucratic Imaginaries and Everyday Practice in the Late Twentieth Century

Organized Session

2:00 to 3:30 pm - Thursday 13 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon A3

Bureaucracies obscure and displace decision-makers, introducing intermediaries, procedures, and processes that create the apparently faceless systems that Hannah Arendt described as the “rule by Nobody.” But there are people there. Bureaucracies are composed of actors, collaborating, intervening, giving and following instructions. Materialized and enacted through minute activities and technologies, these socio-technical systems offer a potent site to study not only experts but also how experts become bureaucrats, and vice versa. These systems and the projects enacted within them — citizenship identification in postcolonial Pakistan, computerized immigration control in the United States, or environmental regulation surveillance by New York City — attempt to produce legible and manageable populations. Yet a closer look at such systems reveals frictions, distinct tools and media, and ambiguities. The papers in this panel examine the tensions — material, political and affective — that arise from the adoption of these systems. They interrogate the role of bureaucratic actors as well as bureaucratic imaginaries in constructing and advancing the technological systems that can appear faceless or self-perpetuating. In attending to the specificity of bureaucratic practice, this panel follows how and why bureaucratic control, with its attendant technological regimes, manages to extend further into everyday life.

Participants:

Who is a Bureaucrat? Information Systems and Knowledge Practices in Postcolonial Pakistan *Zehra Hashmi, University of Pennsylvania*

This paper opens up the question of who a bureaucrat is, and what makes something bureaucratic. It does so by examining the development of bureaucratic expertise for managing citizen identity in postcolonial Pakistan. Comparing two regimes of identification technology—one paper and the other digital—this paper engages the question of what characterizes bureaucratic work, and how this came to be tied to technological labor. It asks: are bureaucrats always state actors—acting on behalf of a regime of governance—or might they be better understood in other terms? For instance, how do bureaucratic modes of information gathering, particularly for purposes of identifying individuals, draw upon practices of knowledge-making in other domains? What are the implications of extending bureaucratic labor beyond bureaucracies and into social and political life more broadly?

Trash Cops and the Expanded City: Regulating Water Quality in Twenty-First Century United States *Anna Lehr Mueser, University of Pennsylvania*

At the turn of the twenty-first century, residents in a rural region more than one hundred miles northwest of Manhattan, confronted a New York City with a new and expanded role to play in day-to-day life. The rural Catskill Mountains have provided almost all of the city’s water since the mid twentieth century. In the 1990s, New York City was compelled to bring its regulatory actions in line with new federal environmental protection and water quality standards, leading to contentious negotiations with the watershed residents whose lives and businesses would be most directly impacted. I argue that because of these negotiations, New York City was able to achieve extensive authority over its watershed, expanding its property, and bringing its environmental enforcement and bureaucracy into everyday life. In this paper, I explore the role of New York City’s environmental police.. As environmental police searched household refuse on the highway and followed bulldozer tracks through the woods, their activities troubled the boundary between private and public land, angering residents and extended

New York City's bureaucracy ever farther into everyday life.

Computing, Immigration Control, and the Bureaucratic Imaginary *Deborah Naomi Rabinovich, Princeton University*

The introduction of computing technologies to immigration enforcement in the United States altered administrative practices and reshaped the bureaucratic imagination, ultimately reconfiguring the enactment of immigration law. Between the mid-1970s and late 1980s, the U.S. Immigration and Naturalization Service (INS) both reacted to and helped construct a narrative of crisis surrounding unlawful entry. In response, the agency began integrating computer systems into its operations, using automated processes to locate case files, track deportation dockets, and coordinate enforcement. This paper examines the adoption of these systems by the INS during this period, particularly considering the institutional problems they were intended to address. It argues that the symbolic power of the computer frequently exceeded its functionality, projecting control beyond what systems could technically deliver. However, this paper also demonstrates that the adoption of computing made the INS vulnerable to critiques of inefficiency and dysfunction. Paradoxically, failures intensified computerization efforts, reinforcing calls for more automation in enforcement. To that effect, this paper contemplates the relationship between technological capacity and bureaucratic imagination, revealing how divergences and feedback loops can shift the orientation of administrative agencies as they interpret law.

Session Organizer:

Anna Lehr Mueser, University of Pennsylvania

Chair:

Anna Lehr Mueser, University of Pennsylvania

Commentator:

Eram Alam

014. Mysticism and Management: Re-Enchanting Scientific Ignorance

Organized Session

2:00 to 3:30 pm - Thursday 13 Nov.

Sheraton New Orleans: Napoleon B1

The history of science and religion is usually told as a story of opposition. However, recent scholarship has drawn attention to persistent entanglements between the secular and the sacred, from psychical research to Scientology to psychedelic drugs to the transhumanist dream of technological transcendence. The papers in this organized session offer a set of case studies on the uses of mysticism in human sciences, arguing that mysticism often served as a potent epistemological resource for 20th century technoscience. In particular, we find that mysticism offers a set of strategies for the management and coordination of human behavior in a world of technological complexity. Together, these papers ask: what kinds of structural mystery secured claims to predict or control the human? How have scientists drawn on their epistemological privilege to construct identities as "gurus?" What affective appeal did mystical experience offer to economists, biologists, psychologists, and management theorists working at the boundaries of knowledge? How has the promise of spiritual fulfillment been harnessed in the service of technocratic management? By taking engagements with Christian and "New Age" mysticism seriously as epistemological innovations, this panel opens up new approaches to the history of science and religion.

Participants:

Movement, Mysticism, and Management in Mid-Century Britain *Whitney Laemmli, Carnegie Mellon University*

At a 1963 seminar at the British Institute of Management, the management theorist Warren Lamb climbed inside a gigantic 20-sided polyhedron composed of white enameled tubes and began to move around. This icosahedron was modeled on one constructed decades earlier by the Weimar choreographer Rudolf Laban to help his students visualize the "kinesphere" surrounding their bodies. Indeed, Laban was not just a choreographer, but also a

theorist of movement whose ideas derived from a blend of physiology, physics, and neo-Platonic mysticism. For him, the device was a tool for shaping an individual's movements in ways that were in tune with the universe's fundamental laws, freeing their mind and producing new forms of enlightenment and community. As he stretched toward each of the shape's eleven vertices at the BIM, Lamb offered a similar promise to his listeners: that by paying equally close attention to their own movements, these managers could revolutionize their working lives, discovering new "rituals" to infuse their daily work with meaning. Initially taken aback, the organizers of the seminar threatened to cancel Lamb's next appearance unless he abandoned the contraption. Lamb's courses remained oversubscribed nonetheless, and his theories and methods were adopted by a number of mid-century corporations, including IBM, Monsanto, and GE. This paper follows the history of Lamb's work, exploring both its scientific armature and its ties to its mystical predecessors. In doing so, it reveals how and why the ostensibly secular realm of the corporation was shaped by ideas about spirit and ritual performance.

"Wired Up:" Kansas Biofeedback Researchers, Indian Yogis, and the Promise of Self-Control ***Libby O'Neil, Yale University***

At the Menninger Clinic in Topeka, Kansas, a group of psychologists prepared their laboratory for a riveting experiment. In March 1970, the Clinic was host to the Indian yogi and spiritual teacher Swami Rama, who had agreed to be subjected to a series of physiological tests. Menninger researchers Elmer and Alyce Green wired Rama up to a tangle of technical apparatuses and asked him to perform a series of astounding feats: he changed his body temperature, he induced an atrial flutter, and he apparently was able to move objects without touching them. As Rama worked through these tasks, monitoring devices recorded physical traces of his spiritual mastery of the body. Soon after, the Greens took their cameras and bio-monitors on a three month tour of India, where they "wired up" hundreds of spiritual teachers in search of a scientific account of transcendence. This data formed the basis for Elmer and Alice Green's work on biofeedback, a practice they referred to as "the Yoga of the West." Biofeedback is a therapeutic technique that allows individuals to monitor their own physiological state (such as heart rate or body temperature). The technique promised to give sufferers back some modicum of control over their bodies, minds, and perhaps, their spirits. This paper explores the history of biofeedback research at the Menninger Clinic in Kansas, showing how they relied on their Orientalized reading of Indian spiritual practices to develop individual solutions to the psychological stress of modern American life.

Of Heat and Holism: Thermodynamics and Spirituality in Reagan's 80s ***Sebastian Fernandez-Mulligan, Yale University***

A Nobel Laureate, an avant-garde composer, and a scholar of religion walk into an auditorium. This is not the start of a bad joke, but the description of a joint lecture given by physical chemist Ilya Prigogine, artist John Cage, and Harvard academic Hurston Smith in 1990. What unified their disparate interests were two themes: thermodynamics and mysticism. This talk asks how and why these traditions of thought came to be aligned by tracing the history of far-from-equilibrium thermodynamics. Conceived in the 1950s and 1960s to describe systems out of thermodynamic equilibrium, the mathematical methods of far-from-equilibrium physics came to describe everything from the functioning of the economy to the origin of life in the 1980s. As they reached into other disciplines, proselytizers of far-from-equilibrium thermodynamics repeatedly pulled from spiritual thought. I contextualize these thinkers in the changing political economy of science

during Reagan's administration and argue that mysticism and mathematics intersected in two ways. On the one hand, mysticism provided scientists with a holistic framework that explained why mathematics from the natural sciences should function in the social world. On the other, mathematics made such holism visible. Scientists pointed to the formal similarity of models in seemingly disparate fields to argue that their work revealed already-present interconnections. As one put it, his "unrepentant holism" was "born of mathematical necessity." Scientists deployed such arguments to justify their work in a new ecosystem of private funding, wooing support from investment bank executives, publishing moguls, and the young representative Al Gore.

Session Organizer:
Libby O'Neil, Yale University

Chair:
Peter Sachs Collopy, Caltech

Commentator:
María González Pendás, Cornell University

015. Subject to Mediation: Bodies, Matter, and Media in the Human Sciences

Organized Session
2:00 to 3:30 pm - Thursday 13 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon B2

This panel explores the entanglement of media, material culture, and the human sciences across the twentieth century. From Skinner boxes to sleep labs, psychiatric asyla to the nursery, these four papers show how knowledge about minds, subjects, and bodies has been shaped through both concrete practices and theories of mediation, bringing the tools of media history and theory to bear on the history of science. Each paper reveals the media conditions of the human sciences in a different historical context, attending to the possibilities mediation brings for malfunction, misfitting, improvisation, and appropriation.

Participants:

Atmosphere, Environment, Matrix: How Mother Became a Medium *Hannah Zeavin, University of California, Berkeley*

In the post-war era, psychiatrists, child development researchers, behaviorists, and psychoanalysts contributed new theories of mother-infant relations, and with them, they invented new stories about what it was that mothers did with and for and to their children. On both sides of the Atlantic, new idioms produced what I call "media theory of mothering," which tried to revise and address how the mother was impactful on her infant. Mother was variously, and across competing psy-discourses, a mother total "environment," a "climate," a "psychic organizer," as scene of "security" or its absence, a "container," a function, a transmission, a device, an atmosphere, a milieu. She enveloped the child, enclosed the child, and if she was bad at her job, she leaked. Eventually these theories were consolidated by Freud's student, Erik Erikson, under the sign of the "maternal matrix." As I show in this talk, diagnosing maternal mediacy became central to psychoanalysis, behaviorism, and the emergence of cybernetics theories of development (of biological organisms, of children) across this period. Theories of maternality have sat close to theories of the conveyance for centuries—whether maternal imagination, mother's marks, maternal imprinting. Here, under the mid-century sign of "mother-as-medium" they join fully. Bio: Hannah Zeavin is an Assistant Professor of the History of Science in the Department of History at UC Berkeley. She is the author of The Distance Cure: A History of Teletherapy (2021) and Mother Media: Hot and Cool Parenting in the 20th Century (2025).

Behaviorism Bricolage: Box, Relay, Recorder *Jeff Nagy, York University*

In the 1940s and 1950s, psychology was transformed by the surreal conjunction of modified kymograph drums, analog relays scavenged from Bell Telephone, aluminum camping coolers sold by Sears Roebuck under their J. C. Higgins sporting line, and pigeons. This talk sketches a joint genealogy for this conjunction through three critical components of BF Skinner's behaviorist laboratory — operant

conditioning chamber, control relay, and cumulative recorder. It analyzes the mid-century behaviorist laboratory as a media environment fashioned from creatively misused and salvaged products of the postwar boom in consumer culture, products, that, like the camping cooler, carry with them a particular vision of tinkering suburban masculinity. Elsewhere, I have argued that mid-century behaviorism pioneered the epistemology and methodology that underlies big data mining and AI-fueled surveillance capitalism. This talk investigates the entanglement of these roots of our contemporary economic order with a science made from surplus consumer and infrastructural production. Skinner and his disciples sought to empty out the subject to show how it could be brought under the control of a controlling environment via continuous monitoring and reinforcement. Here, I argue that the proto-clinic they cobbled together from consumer goods to engineer the behavior of pigeons was always already economic, in ways that echo through their later expansion of operant conditioning to human subjects at the end of the 1950s and throughout the 1960s, and down through behaviorism's enduring legacy today.

Fast and Loose (in and out) Traces of the Asylum Image ***Perwana Nazif, University of Southern California***

Among Catalan militant and psychiatrist Francesc Tosquelles's various experimental methodologies at Saint-Alban psychiatric hospital in France in the mid-twentieth century across media and object production, the camera figured as an especially important pedagogical and social tool. "This will change," reads a title card in his Film Tosquelles (1958) referencing the constant transformation the asylum, but also the image, must undergo. Functioning as a collective facilitation of movement both within and beyond the walls of the hospital, the couch, and instituted care, Tosquelles's collective practices sought a structured, but liberated circulation of movement, of expression, of desire. How, then, does the camera itself function within this structured, yet loose movement within and outside of the hospital? How does the captured, produced and disseminated image participate in the production of a horizontal, collective effort that traverses political, libidinal, aesthetic and subjective economies? Is the camera necessary? I will explore the camera and image as a particular(ly troubled) medium and material in (onto-photo-logical) relation to the hospital's two newspapers, Trait d'union and Le Chemin, one of which was only to be circulated within the hospital. Specifying the many 'outsides' of Saint-Alban hospital and Institutional Psychotherapeutic practice, including its specific clinical knowledge and epistemological-ontological production, I will trace Tosquelles's social image with the concurrent use of the camera in experimental educator Fernand Deligny's nomadic para-institutional collective of "maladaptive" youth (who would have otherwise been institutionalized or incarcerated), the material conditions and production of the collectively-made image, and Deligny's contemporaneous writings on the pedagogical, existential and, later, autistic image.

Normal Accidents: Trained Judgement at the Nexus of Machine, Body & Bureaucracy ***Laura Stark, Vanderbilt University***

This paper analyzes one episode in the long history of clinical research to explore trust, judgement, and labor in science in the context of modern bureaucracy. How does "trained judgement" (Daston & Galison) function in modern bureaucracy, which is characterized by being routine-driven, decentralized, and yet strongly hierarchical—prone to what organizational sociologist Charles Perow called "normal accidents"? Bringing the concept of trained judgement together with the history of science bureaucracy and (de)skilled labor, this paper theorizes the nexus of machine, body, and bureaucracy through media studies and the

phenomenon of the accident. In 1980, Catherine G (pseudonym), who was a “normal control” research participant died on a sleep study at the US National Institutes of Mental Health. Catherine’s death was reported on the front page of the New York Times and prompted a media frenzy. Both captivating and devastating, the story revealed that an EEG connected to Catherine while she slept had told a technician that she died, but the technician decided the machine was broken. The technician only discovered Catherine’s death in the morning. Rather than focus on the vast coverage Catherine’s story received in the mass media, this paper explores approaches from media studies to ask not what materials mean but instead to ask how materials mean and why they mean. Doing so offers insights for history of science on the relationship between labor and judgment. How does trained judgment function in the context of massive bureaucracy with replaceable deskilled workers? How is trained judgment enacted, contested, or confounded through its partnership with machines—registering bodies, bureaucracy, and capitalism? When does a machine break and what does it mean to be broken? And how might judgement be fruitfully untrained in science and its histories?

Session Organizer:

Jeff Nagy, York University

Chair:

Stephanie Dick, Simon Fraser University

016. Rethinking Sources in the Study of Ancient Science

Roundtable

2:00 to 3:30 pm - Thursday 13 Nov.

Sheraton New Orleans: Napoleon B3

Responding to an Early Sciences Forum initiative, this roundtable invites an exploration of one of the most critical questions in the study of ancient science: the nature and limitations of our sources. Since ancient science is shaped by the texts, artifacts, and material records that have survived, our understanding is deeply tied to the shape and content of this fragmented database. Through diverse case studies, our speakers will tackle key challenges and opportunities in accessing and interpreting these sources: What survives, and how do we access it? What does the material landscape of ancient science look like, and how do issues of preservation, transmission, and textual tradition shape our knowledge? Beyond linguistic proficiency—how do we engage with these sources? What are the limits of our data, and how do we assess the reliability of what we have? What makes a source useful for reconstructing the history of science? How can we critically evaluate the role of ancient texts, inscriptions, and material remains in shaping our narratives of scientific thought? What kind of history can we write from these sources? Given the fragmentary nature of our evidence, what are the possibilities and constraints in telling a history of ancient science? This discussion aims to provoke a deeper conversation about methodology, historiography, and the evolving challenges of studying ancient scientific traditions. The following speakers will be taking part in the roundtable : Reviel Netz (Stanford University) ; Theofanis Tsiampokalos (currently Trier University - next fall University of Patras) ; Eduardo A. Escobar (University of Bologna) ; other speakers are expected.

Session Organizer:

Angélique Félicia Edwige Lemarchand, Nantes Université

Participants:

Reviel Netz

Theofanis Tsiampokalos

Eduardo Escobar

Anita Radini, University College Dublin

017. Measuring Publics

Contributed Paper Session

4:00 to 5:30 pm - Thursday 13 Nov.

Sheraton New Orleans: Napoleon A1

Participants:

‘**I Cannot See the Filling of these Papers can Enable us to Come to Any Satisfactory Conclusions’: Failed Data Collection Initiatives and Domestic Privacy in Karl Pearson’s Child-Study Schedule 1909-1910** ***Julia Irma Eva Gustavsson, University of Oxford***

Suspicion against the collection of personal data, ever-more actualised in the

twenty-first century, has a history as long as the gathering of population statistics, In 1909, statistician and eugenicist Karl Pearson was invited to give a lecture to the Child-Study Society, an organisation aiming to 'secure more sympathetic and scientific methods of training the young' through the study of 'the physical and mental conditions of childhood', populated by a mix of teachers, medical practitioners, and parents. The invitation was accompanied by an offer to 'attempt some practical work in the way of collecting statistics' for Pearson's use. Investigation of children's minds, to reveal information about evolution, personhood, and 'fitness', was in vogue, and the Child-Study Society attempted to utilise this fact to integrate themselves more closely with the scientific establishment. The ensuing discussion resulted in the distribution of a 'Child-Study Schedule' for parents to fill out, but the collaboration quickly turned fraught. Over the following year, Pearson grew increasingly frustrated at the lack of satisfactory responses, avoidant parents, and flat-out refusals to cooperate. Reticence on the part of parents to provide information about their children can be traced to concerns about privacy in the period, and wariness of the evident eugenical aspect of Pearson's research. In refusing to supply information about their children, parents were demonstrating that there was little perceived gain to sharing data. However, when parents perceived opportunities and there was a sense of trust between investigators and parent being solicited for information, information was willingly released.

"A Game and a Serious Study": Popular Psychology and the Personality Quiz in 20th Century America ***Jonathan MacDonald, Brown University***

Why and how did Americans come to understand themselves as "personalities"? This question, introduced by Warren Susman over 40 years ago, has fascinated cultural and intellectual historians. While the history of the social sciences has enjoyed a vibrant resurgence, much of the literature has focused on contextualizing the political impacts of major thinkers, ideas, and research centers. This is a valuable development, but there remains something unsatisfying in studying elite discourse as elite discourse. How did social scientific ideas circulate in popular culture, and how did popularization transform the ideas themselves? This paper offers an intellectual and cultural history of popular psychology "from the bottom up" using a set of mundane and overlooked sources: popular "self-help" personality tests and quizzes published in newspapers, magazines, and books. These quizzes operated therapeutically, promising self-transformation through self-understanding. Short-format, self-administered, and self-scoring pop-psych quizzes appeared in newspapers and magazines starting in the interwar period, especially in literature aimed at women. Despite being with us for a century, no authoritative scholarly history exists on these minor "technologies of the self" as a form of entertainment and didacticism. This is notable given that at least one prominent psychological figure, motivational researcher and Madison Avenue consultant Ernest Dichter, worked in the genre across his career. More to the point, these quizzes traded on vocabulary and validation from the emerging field of psychology. This paper will explore the relationship between popular-press quizzes and their more standardized counterparts, including personality psychology questionnaires, IQ tests, and the MBTI.

"Sharpening the Tools in the Workshop of Democracy": A History of American Public Opinion Research ***Tal Arbel, University of Pennsylvania***

After World War II, social scientists in the United States widely adopted new "scientific" survey methods. Originally emerging from journalistic practice, the stratified sample survey was hailed as a scientific solution to inaccurate straw polling and became a fixture of both the American media landscape and the

practice of postwar social science. While surveys were presumed to be the most precise means available for measuring public opinion, their scientific status at their inception in the 1930s and 1940s was unclear and contested. Pioneers like George Gallup imagined the scientific survey to be a political tool that upheld the principles of American democracy, which jeopardized its claim to objectivity for critics. Arguing that opinion was unquantifiable, many claimed that polling is not – or could never be – scientific. This paper sets out to examine the debates among commercial researchers, academic social scientists, and political commentators regarding the merits and limitations of this scientific instrument. How was the survey 'tool' constructed, and what analogies guided its use? What assumptions about public opinion (and, in turn, about the public itself) were embedded in the tool? How did pollsters respond to charges that their tool was inherently unscientific? In contrast to the largely positivist histories of this practice, I argue that the scientific legitimacy of opinion surveys and their constitution as a highly regarded measurement tool, was dependent to a large extent not on methodological fine-tuning, but upon a process of professionalization, which manifested in the establishment of professional organizations and the appearance of a new category of survey expert, the “pollster.” That is, the imposition of both methodological and professional standards imbued the survey with materiality, allowing it to emerge as a technical “tool” in parallel with the emergence of survey technicians.

018. Animals and the History of Science in East Asia

Contributed Paper Session
4:00 to 5:30 pm - Thursday 13 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon A2
Participants:

Crafting Equine Bodies: Healing Practices in Early Chinese Medical Manuscripts

Fang Wu, The University of Chicago

This paper investigates the intersection between equine care and medical knowledge in early China, exploring how horses were conceptualized within historical discourses surrounding science and healing practices. Drawing upon newly excavated manuscripts from the Qin and Han periods (221 BCE–220 CE), this research utilizes Michel Foucault's theory of the body as a constructed entity embedded within power relations. By analyzing these veterinary texts, I demonstrate how the equine body was perceived and medically treated in ways analogous to human bodies. Texts such as the Book of Horse Physiognomy, alongside recently unearthed medical manuscripts from various archaeological sites, illustrate that equine physical characteristics were systematically categorized within the broader framework of early Chinese arithmancy. These practices closely paralleled contemporary human physiognomic studies. Furthermore, veterinary treatments for equine diseases combined empirical medical methods with magical rituals, highlighting a conceptual overlap with human medical practices. A particularly compelling example involves the treatment of internal ailments, such as cardiac pain in horses, through ritualized magical interventions involving incantations and symbolic gestures. These therapeutic approaches closely mirror contemporaneous treatments for human conditions, reflecting an integrative cultural logic wherein empirical observation was seamlessly combined with spiritual and magical practices. Through an examination of both textual evidence and ritual practices, this paper argues that veterinary knowledge in early China was far from peripheral; rather, it constituted an integral component of medical discourse. It underscores that the conceptual boundaries between human and animal health were porous, mutually influential, and reflective of broader epistemological and cultural paradigms.

Elephants Without Trunks: Remaking Maoist Pigs through Animal Hybridization ***Hairong Huang, University of Toronto***

This paper focuses on pig experiments in Maoist China (1949-1976), exploring radical technological attempts to hybridize pigs with distant species such as bovines, goats, rabbits, and even elephants. The goal was to magically merge the advantages of different species into a new animal. During the Great Leap Forward, these experimental attempts were seen as a revolutionary liberation of science from the rigid biological rule of reproductive isolation, aiming to remold animals according to practical human needs. In Chinese historiography, these experiments have often been cited to demonstrate the absurd and antiscientific nature of Chinese Communist rule. However, this paper contextualizes those experiments within a broader framework of cross-cultural interspecific hybrids, particularly the impact of Lysenko-Michurin biology on China, which reinforced the Darwinian evolutionary theory of "survival of the fittest." Specifically, this paper traces the concept of dongwu zajiao [animal hybridization], examining how a series of agricultural techniques originally used on plants in the Soviet Union were radicalized and extended to animals in China. I argue that pigs were degraded from sentient beings to senseless organisms in their hybridization with distant species, as if they could merge into a new organism like plant grafting. This epistemic degradation served to segregate humans from the rest of the animal kingdom and justify a presumably socialist, revolutionary, and scientific classification of the natural order—encapsulated in Chairman Mao Zedong's motto "Man must conquer nature."

Fat Cattle, Measured Power: Ritual Standardization and Statecraft in Late Chosŏn Korea ***Junglim Lee, Seoul National University***

This paper examines how the state government of late Chosŏn Korea used the quantification and standardization of ritual materials as a form of statecraft. Focusing on livestock—especially cattle and pigs used in state sacrifices—it also considers materials such as ice and ceremonial vessels. Rituals in this period served as key stages for asserting royal authority and strengthening Confucian ideology. Materials used in these ceremonies were required to meet strict standards to uphold ritual dignity and symbolic order. While some ritual goods were produced by central bureaus, many were local products transported to the capital. Among these, black cattle were especially valued as ideal sacrificial animals. Raised in designated regions and sent to central offices, they were further nurtured for ritual use. However, repeated disputes arose over whether these animals had achieved a sufficient degree of fattening to qualify for sacrifice. Failure to meet these standards could result in the punishment of both local and central officials. At the core of these tensions was the problem of how to quantify a qualitative condition—what it meant to be "fattened." This question ultimately concerned whether the king could trust standardized measurements over personal judgment, and how such metrics related to royal authority. This study argues that the politics of measurement and regulation surrounding ritual goods became a critical mechanism through which the state evaluated bureaucratic performance and extended control over provincial governance.

019. Eugenic Thinking

Contributed Paper Session

4:00 to 5:30 pm - Thursday 13 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon A3

Participants:

Did Charles Darwin Support Eugenics? ***Erik L Peterson, The University of Alabama***

Francis Galton, cousin of Charles Darwin, has long been identified as the "Father of Eugenics." Indeed, Galton coined the term in 1883, a few months after the death of Darwin. Still, American eugenicist Charles

Davenport ranked Charles Darwin as one of the two founders of eugenics. We have long known the cousins corresponded both with each other and with other naturalists over societal degeneration and what to do about it. But was Davenport correct? Did Darwin's views mirror Galton's, and does he deserved to be lumped in with other eugenics progenitors?

Defining "The Jew" in the Age of Eugenics: American Jewish Physicians and Biological Jewishness in the Early 20th Century ***Leigh Alon, Johns Hopkins University***

The arrival of millions of new Jewish immigrants, as well as the rise of the eugenics movement, led to an increase in antisemitic sentiment in the United States in the early 20th century. American Jewish physicians, like other Jews, represented a wide range of ideologies regarding how this frightening trend should be addressed at home and globally, running the gamut from religious orthodoxy, to Jewish immigration to Palestine, to Jewish autonomous communities in the United States, to the complete integration of Jews with their fellow Americans. Unlike most American Jews, however, they were especially well equipped to couple these recommendations with their authority on Jewish biology, directly countering the scientific racism of eugenicists. This insider knowledge, along with the high esteem medical men were held by Jews at the time, made the voices of American Jewish physicians central to the community's answer to "The Jewish Question" in the United States. While they disagreed on some biological nuances, early 20th century American physicians were broadly united in their resistance to a hereditarian notion of Jewishness: that Jewishness was biologically inscribed and that the Jewish body was inevitably distinct from the rest of the human race. By delving into the published writings, personal correspondences, and diary entries of three ideologically diverse Jewish physicians, I will show how in contradistinction to their post WWII counterparts, early 20th century American Jewish physicians, regardless of their politics, saw delegitimizing the biological basis for Jewishness as imperative towards securing their community's future.

How Science Performs: Using Eugenics as a Case Study for Integrating Performance and Science Histories ***Mia Levenson, Johns Hopkins University***

In their co-written book, Laboratory Life: The Construction of Scientific Facts, sociologists of science Bruno Latour and Steve Woolgar provocatively claimed that "scientists are...performing the world we live in."1 But what does it mean to "perform science"? How does the performance of science inform how scientific ideas develop and move into popular lexicons? What are the ways that historians can understand science history through a performance analytic? As part of my ongoing work examining the co-constitutive relationship between eugenics' influence on popular culture and eugenicists' attempts at scientific legitimacy, in this paper I look to the U.S. eugenics movement to explore how performance historiography can be useful to historians of science. To do so, I explore how the Eugenics Record Office trained eugenicists to perform field work. Critical to this endeavor was the summer training program. For at least three years of the program, superintendent (and co-playwright) Harry Laughlin led students and staff in a production of Acquired or Inherited?: A Eugenical Comedy in Four Acts. Alongside lectures and laboratory experiences on the hereditary mechanisms, the play was part of students' education in eugenics. But why, among all these demonstrations of scientific rigor, did Laughlin include theatre as a part of students' learning? In this paper, I use Acquired or Inherited? to consider the ways that the Eugenics Record Office's training program taught students how to perform science for multiple audiences including other researchers and for the lay public. This performance of science, I contend, was crucial to eugenics

researchers attempts to legitimize their work as a science. I draw on my training in theatre and performance historiography to think about how fieldwork was its own performative practice. Looking to the daily and repetitive tasks of eugenics fieldworkers, I offer a model for historians of science to think deeply about “mundane” histories of science and the corporeal practices involved in the creation and affirmation of scientific authority.2 1. Bruno Latour and Steve Woolgar, Laboratory Life: The Construction of Scientific Facts (Princeton: Princeton University Press, 1979), 285. 2. Christopher Lawrence and Steven Shapin, “Introduction: The Body of Knowledge,” in Science Incarnate: Historical Embodiments of Natural Knowledge, Christopher Lawrence and Steven Shapin, eds. (Chicago: The University of Chicago Press, 1998), 4.

Finding Eugenics in the Postwar Social Sciences ***Emily Klancher Merchant, University of California, Davis***

Since the 1985 publication of In the Name of Eugenics by Daniel Kevles, historians have identified eugenic projects on every inhabited continent in the decades leading up to World War II. Much less research, however, has examined the period since World War II. Existing histories focus on the continuation of involuntary sterilization in the United States and the eugenic roots of medical genetics and genetic counseling. But eugenics also continued in the social sciences, particularly behavior genetics, a subfield of psychology that received institutional and financial support from the American Eugenics Society (AES), and whose practitioners led the AES through its conversion to the Society for the Study of Social Biology (it is now the Society for Biodemography and Social Biology). Today, eugenics has taken a molecular form in sociogenomics. This paper uses structural topic modeling to examine the intellectual continuities and discontinuities between eugenics, behavior genetics, and sociogenomics. The corpus includes the full print runs of the Annals of Eugenics (now the Annals of Human Genetics), Eugenics Quarterly (now Biodemography and social Biology), the Eugenics Review (now the Journal of Biosocial Science), the Journal of Heredity, Behavior Genetics, Twin Research and Human Genetics, the American Journal of Human Genetics, Ethology and Social Biology, Evolution and Human Behavior, Personality and Individual Differences, and Intelligence. Structural topic modeling will elucidate how the content of these journals differed from one another and how it changed over time, particularly as journals dropped the word “eugenics” from their titles.

020. The Technoscience of Sound

Contributed Paper Session

4:00 to 5:30 pm - Thursday 13 Nov.

Sheraton New Orleans: Napoleon B1

Participants:

Troubling Tones: Empires, Experiments, and Sciences of Speech in Late 19th-Century Britain and China ***Qi Hong, University of Toronto***

This paper offers a comparative history of phonetic experimentation in nineteenth-century Britain and China, examining how speech science shaped, and was shaped by, imperial configurations of knowledge and power. It focuses on the analysis of pitch variation, which was a shared preoccupation among philologists, phoneticians, and other language scholars. Using personal records and institutional archives, it traces how speech became an object of empirical inquiry and a political concern across the two empires. Set against the backdrop of British colonial expansion in Asia and the Qing imperial reforms of westernization, this paper explores contrasting knowledge paradigms that informed coeval programs of language standardization. This paper consists of three parts. The first focuses on the technological instruments for understanding pitch variation in speech. It examines how experimental phoneticians in different imperial contexts sought to measure, classify, and discipline the spoken language. The second part

analyzes theoretical models of tones and accents, focusing on how scholars sought to map and explain linguistic differences across regions and ethnicities. The third part situates these experimental practices within asymmetrical imperial relations, showing that while listening and transcribing functioned as techniques of colonial governance, they also exposed the limits of scientific authority and energized alternative interpretations and practices. Ultimately, this paper presents a critical history of phonetic science, in which studies of regional speech were at the heart of colonial rule and expansion. It also shows that such studies were always filled with errors and inaccuracies, opening up spaces for local resistance against the imperial regime.

A Recreation of the Greatest 'Curative Influence': Music in the Victorian Lunatic Asylums ***Jacqueline Morgan***

Music has, throughout history, been noted for its therapeutic effects, with recent studies emphasising the healing power of music for brain disorders. However, music therapy is not a modern phenomenon; the inextricable link between music and the mind has long been recognised, and it is therefore unsurprising that music became an integral part of early psychiatric institutions, especially the Victorian lunatic asylums. While histories documenting the musical life of the asylum are limited, asylum reports frequently mention musical events for the patients, with the asylum band being an important feature of many Victorian asylums. In particular, the Worcester Asylum invested greatly in its musical resources, hiring renowned English composer Edward Elgar as asylum bandmaster in 1879. Often dismissed as simply an additional recreational activity, music was occasionally integral to patients' treatment. As Dr Sherlock, superintendent of the Worcester Asylum, comments in 1857: 'no other means of recreation have been observed capable of realizing a similarly curative influence'. Here I provide an exploration of the musical life of Victorian asylums, challenging the traditional viewpoint of music being a mere addition to recreational activities and presenting it at as an early form of 'music therapy.

Imagining Techno-War: Protest Music and Critical Consciousness of the U.S. War in Vietnam ***Garrett McKinnon, North Carolina State University***

Musicians enunciated popular critiques of the U.S. War in Vietnam. Radio waves and vinyl records distributed across space songs' political messaging about the war to millions of listeners. Song recordings drew listeners' attention, training ears and minds upon the sounds of singing and instruments. As U.S. combat operations in Vietnam escalated in devastation culminating in the most unpopular war in American history, song writers stoked anti-war sentiments, targeting the U.S. war machine for lyrical barrage. Protest songs captured people's senses and imaginations shaping their ideas about war and peace. Historians of science and technology are increasingly attuned to the historical significance of songs' production and dissemination of political messages. The music of the anti-Vietnam War movement has received much scholarly attention. Yet, the existing scholarly literature has not examined how Vietnam War protest music interrogated modern warfare's dependence upon science and technology. This paper argues the "techno-war" in Vietnam became many songwriters' political muse. Chart-topping songs like Bob Dylan's "Masters of War" or Jimi Hendrix's "Machine Gun" critiqued war's industrialization and mechanization, while enunciating broader ideas about gender, race, and class relations. As millions of Americans faced the prospect of being drafted and dying in war, as news of atrocities committed against Vietnamese civilians got out, protest music voiced the growing discontent with America's violent way of being in the world. My paper interrogates the key themes of Vietnam War era protest music arguing musicians were important generators of popular critical consciousness about war and

peace.

021. New Approaches to Early Modern Medicine

Contributed Paper Session

4:00 to 5:30 pm - Thursday 13 Nov.

Sheraton New Orleans: Floor 3rd Floor - Napoleon B2

Participants:

Spirited or Vexed by Melancholy: Harmony and Discordance in Early Modern Italian Medicine and Religion *Jessica Hogbin, Syracuse University*

In 1628, physician Pietro Spiera came before the Venetian Inquisition under suspicion of heresy, having claimed in an apothecary shop that the miracle of a spirited woman identifying a vial of Christ's blood could have been preformed by any melancholic woman. Melancholy, a concept developed for humoral theory, had significant utility both within medicine and beyond, but the implications of the humor's function within religious philosophy opened it to controversy. Melancholy functioned as a means to explain illness, both physical and mental, with a variety of disorders born from an excess of the humor, including the eponymous disease. Italian physicians wrote both that melancholics were more likely to experience possession and, more controversially, that the experience of melancholy could be confused with demonic experience and miracles. Regional illnesses thought to be caused by melancholy, such as the "Male di Santa Marta," which was based in Saint Ambrose's exegesis of the Gospel of Matthew, built on Christian philosophy to explain bodily function. Yet, the Catholic Church was anxious about how the increasingly popular term was used within medical publications, resulting in the censorship of works, such those by Gerolamo Cardano, discussing melancholy's relationship with possession and witchcraft. Through the study of necrologies, medical treatises, and Inquisition testimonies from early modern Italy, this paper engages with the collaboration and conflict of medicine and religion in early modern Italy, in which terminology was used across fields to strengthen their philosophies while also often leading to disagreement and discontent.

Captive Bodies and Public Health in the Early Modern Mediterranean: The Medical Practice of Galley Physician Alessandro Pini (1653-1717) *Valentina Pugliano, Massachusetts Institute of Technology*

In a dramatic reversal of fortunes typical of Mediterranean slavery, the Florentine physician Alessandro Pini (1653-1717) ended his life in Istanbul's slave bagno. For the previous thirty years, after a stint in the 1680s exploring Egyptian flora for the Granduke of Florence and two summers corsairing with the military Order of St. Stephen, Pini's job had been to ensure the health of convicts and slaves, alongside Christian merchants and soldiers. He was first galley physician on the Venetian fleet engaged in the Peloponnese wars against the Ottomans, later personal doctor to the Venetian ambassador in Istanbul, and finally resident physician at one of Venice's convict hospitals (ospedale de' galeotti) in Napoli of Romania (Nafplion). In contact with Italian scholars including his patron Francesco Redi and the apothecary Diacinto Cestoni, he had expressly chosen such positions to cultivate his interests in cartography, archaeology and natural history. Pini's case is instructive not only of the variety of contradictory roles which early modern physicians played in the Mediterranean slave trade; but also, because he was one cog in a much larger public health initiative established by the Venetian Republic in the eastern Mediterranean and Levant to guard its representatives, manage the threats of plague epidemics, and also – a facet still in need of study – preserve its convict and captive population.

Drawing out the Sickness: Medicating and Visualizing the Body with Red Chalk in Sixteenth-Century Southern Europe *Katherine White, University of California, San Diego*

Red ochers have an extensive, global

history as remedies for treating ailments of the blood, applied both externally and ingested. So, too, have red ochers long been incorporated into artworks as pigments, favored for rich, blood-like hues from varying concentrations of oxidized iron. The relationship between alchemy, pharmacy, and artists' pigments has been explored by historians of both art and science, focused primarily on painting. This paper considers the varied applications of red ocher by Early Modern artists, pharmacists, and medical practitioners instead from the perspective of its use in drawing, with a focus on anatomical and medical images from Iberia and Italy. The introduction of red ocher into drawing as a mined natural chalk was popularized in the fifteenth and sixteenth centuries. Its texture and tonal variation bred new techniques for artists, while also introducing increased use of color into the drawing medium itself. Desire for customization and consistency led eventually to experimentation with synthesizing chalks–artist manuals record recipes for grinding raw chalk to be heated, mixed, and dried into crayons, along with discussion of use. Through analysis of red chalk drawings and contemporary reference to chalk fabrication and application, this paper adds to literature on the "epistemic image" traversing the co-development of representational practices and scientific visual epistemology. It considers how the use of chalk for representing life evolved as the tool was itself increasingly crafted using methods from chemistry and pharmacy, proposing questions on the relationship between artists' materials and practices for visualizing medical and scientific debate.

022. Alternative Science Studies and Conservative Critique

Roundtable

4:00 to 5:30 pm - Thursday 13 Nov.

Sheraton New Orleans: Napoleon B3

Critical histories of science and technology promise democratic ends—to overcome the narrow conception of a liberal past for something more. Yet, critical studies of science are also haunted by alternative genealogies, ignored or dismissed like the impolite uncle rarely invited to the family table. This roundtable is a charge to recontextualize science studies in embrace of this queer relative and his, often belligerent, conservative critique. We are interested in things we are taught not to see, intellectual kinship and disavowal, mass culture and the elusive promise of democratic freedom. We find not just remarkable similarities, but explicit shared material among science studies and contemporaneous actors like Michael Crichton, Newt Gingrich, and Francis Schaeffer. At this particular historical moment, we are then compelled to center the conservative critiques of liberalism from Viktor Orban's Hungary, the American anti-eugenics movements, and global libertarian thought. We turn therefore to both lesbian feminist and evangelical exegesis in light of existential threats to the university. Our goal is not simply to point out uncomfortable resonances. We argue for integrating these relatives into a robust understanding of our collective vocational project. Above all, this panel seeks to explicate critique itself. Specifically, we use these alternative genealogies to examine the depoliticizing and repoliticizing promises of critique in the context of popular and populist social movements, especially the resurgence of national and global antidemocratic movements. In doing so, we question the taken-for-granted assumption of critique's democratizing and leveling power, while recognizing its world-building power.

Session Organizer:

Marc Aidinoff, Harvard

Chair:

Joanna Radin, Yale

Participants:

Joanna Radin, Yale
Myrna Perez Sheldon, Ohio University
Beans Velocci, University of Pennsylvania
Cameron Brinitzer, Max Planck Institute for the History of Science
Marc Aidinoff, Harvard

023. HSS Opening Plenary: Science in American Life: Reflecting on the Public History of Science at the U.S. 250th

Roundtable

6:00 to 7:30 pm - Thursday 13 Nov.

Sheraton New Orleans: Floor 3rd Floor - Napoleon C

In 1994, the Smithsonian's National Museum of American History opened "Science in American Life." The 13,000-square-foot exhibition offered museum visitors a tour through the "the scientific issues, controversies, and achievements that have shaped modern American culture." But the exhibit itself was controversial, as the scientific societies that supported it came to lament its critical orientation toward the technoscientific history of the United States. With the U.S. Semiquincentennial on the horizon, and set against the backdrop of drastic changes in federal science policy, this roundtable takes the conceptual framing of "Science in American Life" to ask the following questions about commemoration, collaboration, and controversy in the public history of science: How can the history of science contribute to public explorations of U.S. history? What strategies might historians and cultural heritage professionals bring to narratives about the place of the U.S. in the development of science and technology more broadly? What forms, formats, and genres (such as museum exhibitions, undergraduate classrooms, podcasts, or social media campaigns) are available for critical, and even subversive, interventions into major commemorative events?? How might historians of science incorporate transnational perspectives and realities into nationally-framed celebrations? Recognizing that "Science in American Life" began with the 1876 U.S. Centennial, what work is possible (and what work is challenged) by the 1776-2026 periodization? How have museums or exhibitions engaged with similar national projects or commemorative moments in the past? This roundtable will include brief remarks from individuals and institutions developing public-facing projects about the history of science. We will explore precedents for this work in an effort to map out challenges and opportunities for the public history of science over the next few years. The roundtable will devote ample time to the discussion of potential collaborations and interventions among and by individuals, institutions, and academic departments.

Session Organizer:

Jesse Smith, Science History Institute

Chair:

Judith Kaplan, Science History Institute

Participants:

Peter Sachs Collopy, Caltech
Adrianna Link, American Philosophical Society
Marta Lourenço
Erin McLeary
Ana María Gómez López, Gómez López Studio
Florencia Pierri, MIT Museum

024. HSS Opening Reception

7:30 to 9:00 pm - Thursday 13 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon D

FRIDAY, NOVEMBER, 14

025. Women's Caucus Breakfast
Breakfast
7:30 to 8:45 am - Friday 14 Nov.
Sheraton New Orleans: Floor 3rd Floor - Maurepas

026. Registration Day 2
8:00 to 5:00 pm - Friday 14 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon Registration Desk

027. Forum on Science and Knowledge in Latin America and the Caribbean
9:00 to 10:30 am - Friday 14 Nov.
Sheraton New Orleans: Floor 3rd Floor - Borgne
Sponsored
Session Organizer:
Elizabeth O'Brien, University of California, Los Angeles

028. Pacific Circle
9:00 to 10:30 am - Friday 14 Nov.
Sheraton New Orleans: Napoleon A1
Session Organizer:
Anthony D. Medrano, Yale University

029. Forum for the History of Science in Asia (FHSAsia)
9:00 to 10:30 am - Friday 14 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon A2
Session Organizers:
Sayori Ghoshal, Krea University
Hyeok Hweon Kang, Washington University in St. Louis

030. Early Sciences Forum
9:00 to 10:30 am - Friday 14 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon A3
Session Organizers:
Mackenzie Anne Cooley, Hamilton College
Patrícia Martins Marcos, University of Oklahoma

031. Forum for the History of Health, Medicine, and the Life Sciences
9:00 to 10:30 am - Friday 14 Nov.
Sheraton New Orleans: Napoleon B1
Session Organizer:
Andrew J Hogan, Creighton University

032. Forum for the History of the Chemical Sciences
9:00 to 10:30 am - Friday 14 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon B2
Session Organizer:
Charlotte Abney Salomon, Science History Institute

033. Forum for the History of the Mathematical Sciences
9:00 to 10:30 am - Friday 14 Nov.
Sheraton New Orleans: Napoleon B3
Session Organizer:
Brittany Shields, University of Pennsylvania
Chair:
Brittany Shields, University of Pennsylvania

034. Forum for the History of Human Science
9:00 to 10:30 am - Friday 14 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon C
Session Organizers:
Ayah Nuriddin, Yale University
Emily Klancher Merchant, University of California, Davis

035. Earth and Environmental Sciences Forum
9:00 to 10:30 am - Friday 14 Nov.
Sheraton New Orleans: Floor 4th Floor - Nottoway
Sponsored
Session Organizer:
Jeremy Vetter, University of Arizona

036. GECC Welcome Room Day 2
9:00 to 5:00 pm - Friday 14 Nov.
Sheraton New Orleans: Floor 3rd Floor - Poydras
Graduate and Early Career Caucus Welcome Room Day 2

037. Exhibit Hall Day 1
10:00 to 5:00 pm - Friday 14 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon D
Exhibit Hall Day 1

038. (De)colonizing the Clinic: Medicine, Race, and Power in Twentieth-Century Egypt
Organized Session
11:00 to 12:30 pm - Friday 14 Nov.
Sheraton New Orleans: Floor 4th Floor - Bayside ABC
What can a history of doctors and clinics tell us

about decolonization, and how does it advance our knowledge of medicine in the Global South? While scholars have deftly interrogated the continuities of colonialism after the end of empire within bureaucratic, scientific, and medical domains (Stoler, 2019; Doge 2007), this panel centers medicine not as a derivative site but as a generative domain through which the very terms of colonization and decolonization were negotiated, contested, and enacted. Taking the case of pre- and post-independence Egypt, this panel looks at the history and legacies of colonial medicine in Egypt and the trajectories of decolonization. It does so by examining the Egyptian asylums and the management of the insane in Egypt at the turn of the twentieth century, German eugenicist doctors operating in 1920s Egypt, the postcolonial evolution of the field of tropical medicine in Egypt, and the postcolonial state's instrumentalization of medicine and doctors on the silver screen. Combining methods from critical visual STS, intellectual history, and the material turn, the panel demonstrates how, by looking at the neglected socio-technical domain of medicine, histories of medicine can challenge certain narratives surrounding decolonization. This panel highlights new contributions to the history of medicine in the Global South by focusing on "failure" as an important and productive dynamic of the colonial project (Appadurai, 2019), highlighting the roles played by Egyptian and European doctors in colonial and postcolonial Egypt, and centering cinema as a potential archive of the history of science and medicine.

Participants:

Reforming Madness in British Occupied Egypt, 1895-1935 ***Sam Pulliam***

During the British occupation of Egypt, the state mental asylums at 'Abbasiya and Khanka, like other colonial hospitals, were contradictions. They were sites of disciplinary power, resistance to or critique of that power, featured in narratives of civilizational progress, nationalism, and, at the same time, were failed institutions. Throughout the entire occupation, they were underfunded, overcrowded, had high mortality rates, and unable to successfully treat patients. They were not the asylums of a Foucauldian nightmare, but they were still intertwined with colonial governance. Yet, if these asylums did not function in the way that doctors and government officials imagined that they should, how did they function? What did they produce? This project explores how Egyptian asylums operated through failure during the British occupation. It treats contradiction and lack, rather than power, as productive and generative. It shows how reform of the asylum was intertwined with—even depended upon—the production of failure: more failure prompted calls for greater reform. Much of what occurred in the asylums were a continuation of patterns from the past, but a larger scale and colonial context created something that functioned far worse than before British intervention, at least in relation to the institutions' rationale. After John Warnock's takeover of 'Abbasiya asylum in 1895, many more Egyptians cycled through the hospital than had been the case in the past, but most of them exited as "still insane." In other words, Egyptians did not go to the asylum to be cured, they went to the asylum to return home as insane. Part of the madness of the asylum was that it was the very location that produced madness that it was supposed to cure.

Environmental Medicine and the Post-Colonial Evolution of Tropical Medicine in Egypt ***Jennifer Derr, University of California, Santa Cruz***

At the turn of the nineteenth century, British colonial authorities focused their attention on Egypt's primary hospital and only medical school, Qasr al-Ayny, advocating that the sky-high prevalence of parasitic diseases in the country, hookworm and schistosomiasis in particular, made the hospital an ideal site for the development of specific research and expertise. In the early decades of the twentieth century, European physicians were drawn to the hospital specifically and Egypt more broadly to perform research in the thriving field of tropical medicine. One facet of the epistemic forms that attached to a broader colonial project, tropical medicine sought to

understand and treat diseases that were particular to the colonial world. While framed by a somewhat capacious notion of "the tropics," specialists in tropical medicine sought to grasp the threats to human health that were contained in the unfamiliar environments of those areas of the world colonized by European powers. This paper explores the fate of the discipline of tropical medicine in Egypt beginning in the 1950s, with the definitive end of the British colonial project and the coalescence of an anti-colonial public health agenda in Egypt. During the 1950s, departments of tropical medicine proliferated as the Egyptian government expanded state infrastructure tied to education, medicine, and public health. Moreover, Egypt was not unique in the persistence of tropical medicine as a vibrant specialty; the field continued to thrive in India as well in the second half of the twentieth century. This paper interrogates the evolving research agenda of tropical medicine in Egypt and the overarching significance of the relationships among environmental forms and healthcare in the post-colonial period.

Germans in 1930s Egypt: Race, Eugenics, Sexology and Technology ***Karim Malak, Wagner College***

In the 1930s, German doctors began immigrating to Egypt as they fled persecution in Nazi Germany. Though Egyptians generally welcomed Germans, especially German Jewish doctors who fled Nazi Germany, they were suspicious of their eugenicists ideas. Egyptians had for the most part challenged eugenicist claims for a simple reason: such ideas often depicted them as part of an inferior race that should not reproduce. But this did not prevent Egyptian medical institutions from practicing sterilization of criminals and the "mentally insane" at the Abassiyya Mental Hospital in Cairo, though many such patients were political detainees. Egypt thus became a laboratory for eugenicist ideas for European doctors for two reasons. First, it had a long established archaeological record of findings. Anthropometrists and craniologists such as Flinders Petrie could test their claims surrounding the racial origins of modern Egyptians and Ancient Egyptians. This proved particularly exciting for British anthropologists and anatomists who argued that the present Egyptian racial stock in the 1930s deteriorated compared to their ancient caucasian Pharaonic forefathers. Second, Egypt was testing Herman Hollerith tabulating machines to process such data. These were the same machines that the Nazis would use to locate European Jews for the Final Solution. The Egyptians used Holleriths to build a quasi-database of Egyptians' biometric biometric data, spurring eugenicist debates in Egypt. This paper presents early findings of research conducted at several private archives that trace the Egyptian-German encounter through the lens of medicine, arguing that interwar Egypt became a laboratory for eugenicist medicine.

The Figure of the Doctor in Nasser-Era Cinema: Film as an Archive for the History of Medicine ***Soha Bayoumi, Johns Hopkins University***

During the 1947 cholera epidemic in Egypt, responsible for the death of over 20,000 Egyptians, the young Dr. Shokry is posted to a remote village. He ends up not only treating the village's patients but also helping them uncover the sources of corruption responsible for their poverty and starvation—namely, the feudal system, represented by the landlord Adel Bey. In time, Dr. Shokry discovers that the villagers obey Adel Bey's orders and that those who fail to do so find themselves in the mental asylum. Dr. Shokry finds himself face-to-face not just with Adel Bey but also with British occupation soldiers and with the village's daya (traditional midwife), who sees him as a threat. In the late 1960s, another doctor, Dr. Aziz, is sick and is sent to an isolated sanatorium in a remote desert area in Egypt. He discovers therein that the hospital is divided into two sections: one for the rich who receive proper care, and one for the poor who

receive free treatment, in name only, but are simply left to languid in overcrowded wards with no proper food, water, treatment, or dignity. The aforementioned doctors are not real doctors but are rather cinematic depictions of doctors in two important 1960s Egyptian movies: respectively, Sira' al-abtal [Struggle of the Heroes] (1962) and al-Mutamarridun [The Rebels] (1968). Both were directed by renowned Egyptian filmmaker Tawfiq Salih, and both doctors were depicted by the famous Egyptian actor Shukri Sarhan. While each film comments on a different period of time, semi-colonial Egypt and the late Nasserist era, respectively, they both offer a window into the depiction of doctors as scientists, as care providers, and as social and political actors in mainstream Egyptian discourse in the 1960s and a glimpse into the instrumentalization of doctors in the Nasserist project as well as forms of critique or resistance to said project via the figure of the doctor. Relying on insights from the history of medicine, the history of cinema, film studies, and critical visual STS, this paper proposes cinema as an archive of social and political ideas about medicine and centers the "performativity of the archive," focusing less on the veracity of what is represented and more on its functions and what it is capable of producing in a particular time and place.

Session Organizer:

Karim Malak, Wagner College

Chair:

Soha Bayoumi, Johns Hopkins University

039. Diagnosing the Self: Immunity, Irrationality, and Habit

Organized Session

11:00 to 12:30 pm - Friday 14 Nov.

Sheraton New Orleans: Floor 3rd Floor - Borgne

The nature and limits of "the self" have long interested both scholars of science studies and the scientists and doctors they study. From scientific efforts to locate the self in brains, bodies, and machines to historians' analyses of "the scientific self" and its role in balancing subjectivity and objectivity, notions of selfhood are everywhere in our primary and secondary sources. Some of the most impactful "turns" in science studies writ large have curved precisely around attention to new people acting either as researchers or research subjects, or else around the boundary work required to police categories such as "scientist," "evidence," and "truth." If the famous phrase of Steven Shapin and Simon Schaffer—"Solutions to the problem of knowledge are solutions to the problem of social order"—means anything, it is this: we cannot decide who knows what without attending, concretely, to the "who." If knowledge exists, it does so only in knowers. The banality of this point reveals its significance: we all "know" this to be true, but too often metaphors like "knowledge production" leave the knowers, the selves, historical actors and historians, behind. This panel addresses itself to the study of "the self" in both historical and critical senses. Each paper addresses a major scientific concept (immunity, habit, and irrationality), revealing in each case a peculiar notion of selfhood embedded in that concept as a contribution to a broader, shared conversation about selfhood and scientific practice. Ranging from the mid-nineteenth century to the present and across Europe and North America, our panelists use ethnographic, historical, and critical methods to unpack ideas and practices in immunology, irrationality, and the self-help industry.

Participants:

Immunity from Selfhood to System: Regulation between Industry and State
Anin Luo, Princeton University

The "immune system" was formulated in the early 1970s at the Basel Institute of Immunology (BII), an academic institution wholly funded by the largest pharmaceutical company in the world, F. Hoffman-La Roche. In the preceding decade, biologists had come to describe immunity as the mechanism through which the body distinguishes between "self" and "nonself"; at the BII, immunologists drew on cybernetics and systems theory to reconceptualize biological selfhood as a self-regulating network of immune cells and molecules. This paper shows how the immune system was invented at the

juncture of political economic transformations in healthcare. With the expansion of welfare states driving the socialization of healthcare worldwide, governments were increasingly regulating the pharmaceutical industry. At the same time, expensive techniques such as organ transplantation in Western welfare states juxtaposed with lack of basic healthcare in poor regions within those countries and worldwide raised questions about who was the subject with a right to health. Roche established BII amid these pressures, with the hope of developing drugs that could regulate the immune system. The paper thus shows how ideas of a regulatable biological self emerged as the pharmaceutical industry itself was being regulated.

Clickers, Tokens, and the Anxiety Economy ***Henry Cowles, University of Michigan***

This paper uses two training tools—the clicker and the token—to explore the rise of an anxiety economy since the 1970s. While clickers and tokens have been used to train a wide range of human and non-human animals to do an even wider array of tasks, they have tended to be used on (and sometimes with) two primary populations: puppies and toddlers. By setting the "clicker training" of dogs alongside the use of "token economies" with children, this paper offers a new history of behaviorism and its aftermath by emphasizing the long legacy of Skinnerian method beyond the scientific laboratory. Dog trainers and, to a lesser extent, childrearing experts were (and remain) slow to disavow B.F. Skinner in the wake of the scientific and cultural repudiation of his ideas that began in the 1960s. This paper explores why this was the case, what the effects of his continued impact were on animal training and childhood education, and how the immense market for advice and accessories in both areas have led to a convergence in how we train dogs and children to communicate, relieve themselves, and interact with one another—and us. The paper, part of a larger project on habit and American political economy, concludes with some thoughts on how animal behavior studies shape our understanding of addiction and anxiety.

The Rationality of the Science Denier ***Nima Bassiri, Duke University***

This paper asks: What precisely does it mean to reject scientific truth claims? Are anti-scientific beliefs really expressions of epistemic and political senselessness, or do they perhaps demonstrate a kind of political rationality of their own? This paper explores some ways that expressions of science denialism can be understood as otherwise coherent displays of political defiance rather than senseless manifestations of scientific illiteracy. The most exemplary instances of coherent, indeed justifiable, forms of scientific distrust are among marginalized communities of color who have historically been (and continue to be in more structural ways) victims of medical-scientific racial violence. But even very different, and otherwise unjustifiable, expressions of scientific denialism nevertheless display a kind of political rationality all their own. American religious conservatives, for example, who oppose certain medical-scientific doctrines have nevertheless historically defended the advancements of military and economic science. The paper also argues that the general commercialization of medicine and science over the past five decades has largely transformed scientific denialism into an enactment of economic freedom, that the "right," for example, to elect not to be vaccinated is an effect of the near-total marketization of medical care. This paper, in other words, explores how science denialism, and the expressions and enactments of selfhood that underwrite it, trouble the presumed boundary of rational social conduct.

Session Organizer:
Anin Luo, Princeton University
Chair:
Nasser Zakariya, UC Berkeley
Commentator:

Nasser Zakariya, UC Berkeley

040. Crafting Knowledge in the History of Art

Contributed Paper Session

11:00 to 12:30 pm - Friday 14 Nov.

Sheraton New Orleans: Edgewood

Crafting Knowledge in the History of Art

Participants:

Re-Inventing Tradition? Theorizing Continuity in Crafting Practices *Mannat Johal, Max Planck Institute for the History of Science*

"Tradition" is a fraught word in the humanities and social sciences, often associated with timeless repetition and in tension all that is new, creative, and innovative. References to "traditional societies" or "traditional practices" have long been recognized as shorthand modes of relegating certain peoples and their lifeways to the realm of the nonmodern. And, influential constructivist renderings have problematized the very reality of something like tradition – a set of cultural principles and practices that hark back to a hallowed past. Yet, as historians of science, anthropologists, and art historians have turned attention towards craft knowledge, scholarship on networks of learning implicitly evoke the temporal and embodied aspects of transmitting tradition. My presentation is an attempt to "re-invent" the concept of tradition with a view to theorizing both continuity and variation in ceramic vessels crafted in Medieval (12th-15th century CE) South India. In particular, I ask how continuities in morphology, and in potter's practices of shaping, adding colour to, and decorating their wares may be historicized. That is, how do these practices draw upon a history of crafting, while producing objects for the future? To do this, I take seriously the valence of tradition as something passed down – an inheritance, a resource that speaks just as much to futurity as it does to pastness. I argue that such an approach holds the potential to treat craft knowledge and learning, repetition, and continuity, as historical – rather than merely sociological or cognitive – phenomena.

The Missing Etymological Record: The Nineteenth-Century Invention of "Ceramics" and Twentieth-Century Controversy *Julia Carr-Trebelhorn, Independent Scholar*

Taking on the task of ordering the sciences related to pottery and clay-based objects, natural historian and porcelainier Alexandre Brongniart sought a new way of describing the ancient practice. Early in his forty-seven-year career as director of the Sèvres Porcelain Manufactory, Brongniart developed a research center for the advanced study of pottery and porcelain making. Brongniart recognized that an inclusive and distinct term for the field was necessary, but it had to be introduced carefully, so that it was welcomed rather than rejected as presumptuous. Through close reading of Brongniart's writings, as well as contemporary periodicals and the texts of other authors, the development of the word "ceramic" – originally introduced by Brongniart and his associates in French as "la céramique" – can be traced closely. I show that this was a deliberate, methodical, and years-long effort to create a durable, comprehensive term. However, in the Twentieth Century, ceramic manufacturing became increasingly technical. The inclusive field Brongniart had envisioned was fracturing. Voices called for the separation of pottery making from experimental, industrial ceramics and the meaning of the term "ceramics" was hotly debated. Numerous etymologies were traced, but, as the predominant language of science transferred from French to English, none of the twentieth-century authors recognized Brongniart's key role in the invention of the term. Critically, this language debate coincided with and reflected the global politics, nationalism, and warfare of the first half of the Twentieth Century.

When did Art Conservation Become Scientific? A Case Study in a New Computational History Method *Leib Celnik, Johns Hopkins University*

This paper builds on the growing body of literature on the history of conservation to further develop a concept of 'the field' and how it emerged. Based on my dissertation research on the history of art conservation in the United States and Europe, I explore of the scientization of art publications in the later nineteenth through twentieth centuries using a new computational method, Dynamic Embedded Topic Modeling (DETM) to track changes in texts over time. My study integrates traditional archival research, oral history, and interviews with a computational approach that allows for both analyzing a much larger number of texts than individual scholars can effectively synthesize and potentially producing novel insights. Combining these methods, I argue that new practices of treating art materials and eventually artworks as objects of scientific inquiry in the latter half of the nineteenth century paved the way for conservation to emerge as a distinct field around 1930. From that point, conservation specifically influenced scholarly literature on art as language directly taken from or addressing chemistry, physics, and later material sciences developed. I discuss both the technical processes (searching for data sources, eventually obtaining over 75,000 documents from JSTOR and developing the codebase in collaboration with other scholars), the humanistic interpretation of this data, and how it compares to insights from traditional historical research methods alone to assess its benefits for other historical studies.

041. Contested Boundaries and Emerging Terrains: In Memoriam for Mary Terrall

Organized Session

11:00 to 12:30 pm - Friday 14 Nov.

Sheraton New Orleans: Napoleon A1

This panel reflects on the enduring legacy of Mary Terrall, Professor Emeritus in the history of Science at UCLA, through the research of her students and colleagues. Terrall's scholarship challenged many intellectual and geographic boundaries–between boudoir and scientific Academy, between natural history and the physical sciences, even between metropole and colony–to reveal how locally produced knowledge came to be seen as universal. The early modern scientific world patiently stitched together by Mary consisted of philosophical and mathematical abstractions, but also laborious observations, flamboyant personas, and a clutter of material things from books and instruments to frogs and insects. Her scholarship was marked by meticulous attention to specificity, revisiting time and time again complex issues and refusing to uncritically adopt historiographical tradition. In this spirit, this panel offers a series of papers that will interrogate various intellectual and geographical boundaries in the history of science to open discussions into new terrains.

Participants:

The Enlightened Chemistry/physics of Air and Fire ***Mi Gyung Kim, North Carolina State***

Historians who characterized Lavoisier's work on air as leading to the Chemical Revolution pondered how he could foresee "a revolution in chemistry and physics" before he even embarked on the research. In interpreting his approach as an application of physics to chemistry, they highlighted the conservation of weight and heat in the chemical equation as the inalienable logic underlying his endeavor. Considering Lavoisier's unusual path to chemistry as an enlightened youth well-educated in a broad range of natural sciences, however, we need to better understand what "physics [la physique]" and "chemistry" meant for the enlightened public and how they made sense of invisible entities such as air, light, and fire which lay beyond routine chemical analysis or physical measurements. This paper will consider how the public sphere of enlightened sciences might have informed Lavoisier's approach to the subject of air and heat. While chemical analysis was limited to solid and liquid substances, public discussions of weight, fire, heat, air, magnetism and electricity involved subtle matters that were related to chemical concerns. Discussions of fire often included its role in chemical actions, while

air quality was a significant part of medical thought well before Priestley's methods of differentiating the "different kinds of air" subjected them to chemical analysis. Lavoisier would have seen that adding air to the domain of chemistry would induce a serious disruption, or a "revolution," not just in chemical practice but also in the larger domain of natural sciences concerning weight, heat, and fire. By focusing on what he could measure with instruments, he would change the very definition of chemical substance and draw new boundaries between chemistry and physics. Mary was my classmate in the seminar on 18C physics taught by Norton Wise. I learned much from Mary and Bill Clark about handling French texts that didn't make sense, I guess. Although my dissertation was on 19C German chemistry, when I decided to move into 18C in order to understand affinity chemistry, Mary welcomed the move and kept me in conversation. I'm now back to the subject we studied together.

Delivering Empire: Race and Colonialism in Midwifery Training in Saint-Domingue
Scottie Buehler, SHSU

After the French losses in the Seven Years War, the stakes for maintaining a growing and healthy population only increased in Saint Domingue (modern day Haiti), the most profitable colony in the world. In response, the crown and colonial authorities turned their attention to midwives as both a source of and solution to infant and maternal mortality. For example, Renouts, a Paris-trained white midwife, instructed a class on accouchement for enslaved women and Cottin, a free mixed-race Creole midwife, apprenticed enslaved midwives in her home. Renouts' and Cottin's pedagogical labors embodied the entanglements of reproduction, midwifery (and its training), and empire building in the French Atlantic. Mary Terrall, by the end of her career, turned her attention to the knowledge exchanges of the Atlantic world. As her last doctoral student, I will draw upon her methodological commitment to mobilizing the specific to illuminate wider social and scientific trends in my efforts to recover the flows and countercurrents of the knowledge, practices, people, and objects of childbirth around the French Atlantic. Ultimately, I argue that midwives and their education played a central role in buttressing the French empire. Gendered, racial, economic, and legal power in the colonial context of Saint-Domingue ensured that white, French midwives accrued economic and gendered benefits from their interactions with African-descended and enslaved midwives. In the end, narratives attentive to the flows of the Atlantic World, and the currents of power directing them, chip away at colonial accounts that cast Europe as the center of obstetrical knowledge production.

The Men Who Traveled the Earth: Sailors and Natural History in the Enlightenment
Karen Oslund, Towson University

This paper explores how we can recover some of the stories of collectors of natural historical objects in the eighteenth century. Throughout her career, Mary paid careful attention not only to scientists, but to ordinary individuals and their labor. In her history of science, knowledge was often produced from the margins by unexpected agents as well as by the usual ones; her finely-grained account of Maupertuis' expedition to Lapland does not omit the Finnish and Saami laborers who carried his instruments through the mountains, and her last published article, on indigo cultivation in pre-colonial Senegal includes the Wolof farmers who assisted Michel Adanson in his gardens. As Mary's first doctoral student, I have long been inspired by her focus on travel and the people involved in scientific collection, expressed in her Curious Encounters: Voyaging, Collecting, and Making Knowledge in the Long Eighteenth Century (with Adraina Craciun). In this paper, I look at sailors' accounts of natural history collections which they made on the Europe-China route, in Africa, India, Indonesia, and China. These accounts show that sailors

collected specimens of animals and plants which they regarded as “unfamiliar” in order to supplement their incomes by selling them in European capitals upon their return. While sailors were untrained in the natural sciences and therefore collected somewhat indiscriminately, they did so with a conscious eye for the market for exotic specimens back at home, and how this market could be accessed. While it is not clear which specimens were collected, how many of them survived the voyage, and how much money they could be sold for, these journals indicate that the practice of collection by sailors was widespread on European trading ships. Although the sailors appear to be mostly interested in the economic value of these sealed jars of eels, fishes, and seaweed, they also made notes about the flora and fauna they observed while making these collections. To what degree can they be considered men “practicing science” in this period, and what do their journals tell us about their knowledge of natural history and their contributions to the science of the time?

Mustic and Sound Techniques as a Means to Humanize Outer Space *Patrick Bonczyk*

Among her many interests in the history of science, Mary Terrall had great enthusiasm for music intellectually and personally. In one memorable meeting, she once called music and sound "the last frontier of the history of science." While sound, music, and science have enjoyed a long terrestrial connection, their connections in outer space have received less study. Recalling this relationship goes as far back as Pythagorus’s music of the spheres and Boethius's harmonics to as recent as the opening waltz in 2001 a Space Odyssey (1968) or the blasting off of the music of JS Bach (among other humanity's greatest hits) on the Golden Voyager Records in 1977. Recently, astrophysicist Matt Russo (University of Toronto) and others have pioneered a suite of techniques studying extra-terrestrial organization and processes using sound, called sonification. But why, in the age of the Webb Telescope, do we still need sound to observe space? Musicologist and one of Mary's last PhD advisees, Patrick Bonczyk, offers some brief thoughts on music, achievement, wonder, and why we continue to humanize space through sound.

Session Organizer:
Scottie Buehler, SHSU

Chair:
Pamela H. Smith, Columbia University

042. The Politics of Technological Innovation in China

Organized Session
11:00 to 12:30 pm - Friday 14 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon A2

“Indigenous innovation” – a key strategy in contemporary China – aims to develop domestic technologies and reduce reliance on foreign technology. As an emergent global technology leader, China has a long history of technological innovation, shaped by ideological frameworks of empire building, nationalism, socialism, and capitalism. Political regimes have also used technological advancement to manage both human and non-human bodies and build a self-reliant technocracy. This panel examines China’s indigenous approaches to technological innovation from the early modern era to the socialist period, highlighting state politics’ role in shaping technology. Chang Xu explores gunpowder technology in early modern China through “Fire Drug” formulas, linking them to medicinal practice and bodily transformation. Haocong Cheng analyzes the adaptation of sheep artificial insemination (AI) in socialist Inner Mongolia, showing how AI was used to control reproductive cycles and improved herds. Zhongxian Xiao investigates biofuel production in Sichuan, Hunan, and Shanghai, revealing how farmers, workers, and drivers contributed to self-reliant innovation and energy policy. Jinghong Zhang examines technological innovation in dental equipment as part of a larger reform of dentistry in socialist China, offering a window into Maoist science at the grassroots level. Together, these case studies reveal how China pursued technological innovation and envisioned an alternative techno-modernity across different historical moments.

Participants:

Attack with Fire: "Gunpowder" in Early Modern China *Chang Xu, Rice University*

Often translated as “gunpowder,” huoyao 火藥 (lit. “Fire drug”) held a broader meaning in early modern Chinese military treatises. While most fire drug formulas in these texts align with proto-gunpowder—mixtures of carbonaceous materials, sulfur, and saltpeter—some formulas lacked sulfur or saltpeter altogether and were neither combustible nor explosive. Instead, these non-combustible fire drugs served diverse functions, including sensory disruption, corrosion, disabling, and poisoning, whether employed independently or alongside other weapons to impair or weaken opponents. By examining how these formulas were grouped under sections titled “Fire Drug” or “Drugs for Fire Attack,” this paper proposes a new framework for understanding gunpowder in early modern China in relation to medicinal practice. I argue that both fire drugs and therapeutic drugs were conceptualized as agents of bodily transformation. These two categories of drugs not only shared overlapping ingredients but also reflected similar compositional logic, allowing users to adjust components to achieve specific effects on the targeted body. While therapeutic drugs aimed to restore the body from illness to health, fire drugs worked to induce states of injury, debilitation, or death. Ultimately, by tracing the textual organization of military treatises, this paper seeks to illuminate the etymological connections between medicine and fire drugs in Chinese discourse and offers a new perspective on the relationship between drug formulas and the body.

Coming to Terms with Oil Shortage: Techno-Politics of Energy Transitions and Innovations in Modern China (1930s-50s) *Zhongxian Xiao, Georgia Institute of Technology*

China’s transition to fossil-fuel energy in the Late-Qing and Republican periods was deemed as a process of growing technocratic control over its coal deposit and hydropower resource. However, as a country with limited petroleum production, how did the oil scarcity reshape this technocratic process? What is the relation between energy transitions, self-reliant technological innovation, and state-building in the wartime and socialist periods? As the Second Sino-Japanese War escalated in 1937, the Nationalist government faced increasing difficulties in petroleum imports due to the Japanese blockade. After 1949, the oil shortage continued as the US imposed an embargo on the newly established communist regime during the Korean War. In response, Chinese engineers of the National Resource Commission’s Industrial Experiment Institute and the red technocrats in the socialist era committed to the innovative experiments of multiple oil-alternative fuels, including tung oil, ethanol, and charcoal from the 1930s through the 1950s. Through examining the research, production, and consumption of biofuel at Sichuan, Hunan and Shanghai, this research reveals that the innovations in alternative energy were conceived by technocrats but underpinned by the massive labor and indigenous knowledge of farmers, factory workers, and experienced automobile drivers. The biofuel may have symbolized Chinese self-reliant innovation and energy policy. But it also led to detrimental effects on the environment in the production zone and the extraction of laborers at the workplace.

Transforming Livestock and Humans Alike: Livestock Artificial Insemination in Maoist Inner Mongolia, 1956-1976 *Haocong Cheng, Duke University*

Cheng Haocong’s essay talks about the adaptation and dissemination of the sheep artificial insemination (AI) technique in Inner Mongolia during the socialist period (1949-1976). This essay uses procedural sequence (chaîne opératoire) as the methodology to analyze several manuals about livestock insemination produced during that period. He argues that the

authors of these manuals, mostly working at animal husbandry institutions, such as schools and governmental agencies, not only treated AI as a technology that could realize humans' goal of creating breeds with better traits but also saw it as a crucial means to control the reproduction cycles of female sheep who gave birth to crossbred offsprings, therefore making possible the scientific management of improved sheep herds. In addition, Cheng argues that the seemingly useless knowledge about the sheep's anatomical features in some of these manuals reflected their authors' goal of introducing the modern biological knowledge of sheep to its readers, many of whom were amateur artificial insemination practitioners who were not familiar with modern science. Since humans' use of technology could change the way they perceive their surroundings, the attempt to popularize AI was more than promoting advanced technology; it demonstrated the state-backed scientists' plan to change the ways with which herders grappled with their surroundings. The introduction of this knowledge, as an ethnic Mongol novelist has shown in his novel, met resistance from older Mongol herders who possessed another form of indigenous knowledge about sheep, reflecting the tension that emerged during the dissemination of modern biological knowledge.

Tinkering with Socialism: Self-Reliant Science and Technological Innovation in Dentistry, 1958-1965 ***Jinghong Zhang, University of Maryland, Baltimore County***

Faced with isolation from the capitalist West during the global Cold War, socialist China (1949-1976) adopted a specific approach to science underpinned by self-reliance, application, mass mobilization, and nativism. In the context of developing Maoist science, "big science" such as infrastructure construction and the development of nuclear weapons was strengthened by massive resource investment. In the spheres of medicine and agriculture, however, the emphasis was put on "mass science," which meant mobilizing the masses and employing tu (earthy or local) methods to surpass the achievements of developed countries. This paper examines technological innovation in the design and manufacturing of dental equipment in China from the Great Leap Forward to the dawn of the Cultural Revolution. As part of a large reform of dentistry from the late 1950s to the 1970s, technological innovation in the dental field aimed to address problems of "mechanical materialism" and the profound neglect of the rural masses. In this process, dental experts tried and recycled cheaper domestic materials and used tu methods in crafting and redesigning dental equipment to make it more portable and accessible beyond the urban areas. Focusing on reducing its reliance on imported or expensive materials and creating the material conditions for the popularization and ruralization of dentistry in the socialist countryside, the technological innovation movement in dentistry offers a window into how mass Maoist science worked at the grassroots level.

Session Organizer:
Jinghong Zhang, University of Maryland, Baltimore County

Chair:
Jinghong Zhang, University of Maryland, Baltimore County

Commentator:
Grace Shen, Fordham University

043. Ancient Sciences in the Academy: Retrospect and Prospect

Futures Roundtable
11:00 to 12:30 pm - Friday 14 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon A3

Over the past four decades, the study of ancient sciences has expanded beyond philological traditions to engage with broader intellectual currents in the history of science. This panel reflects on that transformation, tracing the field's trajectory from the 1980s to the present and asking what comes next. How has the study of ancient astronomy, mathematics, and natural philosophy evolved alongside changing institutional structures and methodological debates? What has been gained—and what has

been left behind—in the process? How have disciplinary divides between history, classics, and philosophy shaped the study of ancient sciences? And as new digital tools and interdisciplinary approaches emerge, where should the field go next? Bringing together scholars with different perspectives on the institutional and intellectual positioning of ancient sciences, this conversation will critically assess the state of the field while opening space for new directions. Organized and Sponsored by the Early Sciences Forum.

Session Organizers:

Mackenzie Anne Cooley, Hamilton College
Benjamin Driver, Brown University
Patrícia Martins Marcos, University of Oklahoma

Commentators:

Daryn Lehoux, Queen's University, National Scholar
Liba Taub, Cambridge University

044. Managing Dead Bodies: Global Public Health, Medicine, and Law

Organized Session
11:00 to 12:30 pm - Friday 14 Nov.
Sheraton New Orleans: Napoleon B1

This panel examines the profound changes in how dead bodies were managed globally in the nineteenth and twentieth centuries. Dead bodies became subjects of imperial and international law, medical and forensic sciences, and gained economic significance as they were traded and transported. They were classified, objectified, pathologized, and treated differently across legal, social, and political landscapes according to categories of race, class, caste, gender, disability and religion. The four contributions in this panel consider different sites of managing dead bodies: borders and graves, criminal courts and forensic laboratories, anatomy laboratories and craniological collections, and finally hospitals and crematoriums. Considering local and regional specificities in the evolving inter-imperial context, this panel argues for dead bodies as important subjects of study of global and imperial histories of science, medicine, and technology.

Participants:

Grave Matters: Corpse Traffic, Secret Burials, and Smuggling in Ottoman Iraq ***Zeinab Azarbadegan, Oxford University***

This paper examines how regulations to contain cholera and plague pandemics before WWI by the International Sanitary Conferences and the Ottoman and Iranian empires affected and changed burial practices in Ottoman Iraq. Looking at mass transport of corpses to Ottoman Iraqi shrine cities from across the region as well as Ottoman Iraqi provinces, I consider how medicalization of the dead body prompted various forms of resistance by the Iraqi subjects of the Ottoman Empire and led to multiple diplomatic crisis in its relationship with Iran. I argue that medical regulations in tandem with evolution of imperial subjecthood politicized both the dead body and the burial sites, extending imperial political belonging to beyond the grave. This paper argues that extraterritorial rights afforded to Qajar subjects followed them to the grave and made the burial sites contested grounds of sovereignty as the Qajar government claimed to protect them. The body was a vehicle of imperial sovereignty and legal jurisdiction, and it did not matter if it was living or dead. This was especially acute for the many graves of Qajar statesmen and royal family buried in Ottoman Iraqi shrines, the administration of which was paid for by the Iranian Government well after the demise of the Qajars. The regulations also affected the local bodies of Iraqi Shi'is, leading to various modes of resistance ranging from uprisings to the smuggling of corpses.

Claiming Corpses: Dead Bodies and Murder Investigations in British India ***Uponita Mukherjee, Fordham University***

In nineteenth-century British India, medico-legal evidence enjoyed tremendous epistemological authority in criminal trials. Evidence extracted especially from dead-bodies by trained government surgeons and doctors acted as a foil for testimonies from Indian witnesses which colonial magistrates and judges were wont to treat with suspicion. But more importantly, the scientific evidence of medico-legal experts was especially valued because magistrates and judges could use them to corroborate and test evidence served up by police

investigations. This paper shows how the distinction between the evidence of police inquiries and medical examinations, which colonial legislation secured in statutes and judges upheld in courtrooms, obscured a hidden history of material work in which medical evidence from bodies of victims were extracted through a sustained, if strained, collaboration between doctors, surgeons and police inspectors. My paper historicizes this relationship and tries to understand why a clear contrast between police investigations and forensic practice was freighted with such moral weight in colonial criminal justice.

Corpses as Living Scientific Objects: Transinstitutionalization, Re-Identification, and the Body ***Trevor M Engel, Vanderbilt University***

This paper examines the nineteenth century corpse trade as a site of erasure, violence, and surveillance of bodies through which specific bodies were identified and othered. The re-identification of bodies into scientific, working objects was then repeated throughout different stages of collection: because of an object being bought, sold, or traded to a new collection or, conversely, because of evolving scientific definitions that were being read onto objects. What I want to explore in this paper are the ways in which objects pushed back against these meanings being given to them by scientific and medical professionals. Bodies were collected, identified as exemplary of specific racial or pathological qualities, and then entered into the global system of trade in bodies and body parts. Although the scope of this trade was international, collectors sent the bodies usually only in one direction: to metropoles. Those scientific and medical understandings of bodily objects also normalized and rationalized the collection of yet more bodies: where contemporary understandings of the body were being created, defined, and employed onto the same people whose bodies made up those collections. I argue that by looking at specific moments of instability when re-identification took place, there is an opportunity to recognize how these objects were/are pushing back against being categorized through top-down scientific understandings of the body. In this paper, I will primarily talk about Indigenous bodies in Samuel Morton's and Joseph Barnard Davis's craniological collections and their legacies in the American and British collections that housed them later on.

Towards a Concept History of the Crematorium: Bombay and Calcutta, 1918-1926. ***Sohini Chattopadhyay, Union College***

This paper investigates the crematorium's role in reshaping the conceptualization and management of the dead body within the context of twentieth-century colonial India. It argues that scientific objects, like the crematorium, produce more than their intended goals, actively participating in the construction of social orders and the creation of phenomena and "excesses" that exceed the apparatuses' intended frameworks. By examining the crematorium's introduction in Bombay and Calcutta, two pivotal colonial ports navigating the British Empire's Indian Ocean trade, this research reveals how discussions on the crematorium intersected with urban space and social practices of death, as the dream of the apparatus constantly impinged on the attendant question: whose bodies could be incinerated mechanically? I explain this question in the two cities through the examination of two case studies: the demand for crematoria during the interwar period, in 1918 Bombay, and 1926 Calcutta. These two case studies will demonstrate how the concept of the crematorium resulted in new identities of dead bodies and in regionally varied ways. Methodologically, the paper draws parallels with research on anatomical science, where scholars have demonstrated how the dead became objectified through medical and laboratory practices. Extending the laboratory to the urban, this paper argues that the crematorium created a different conception of the objectified

body, adjacent but distinct from the concept of the unclaimed body in anatomical practices. The crematorium debates in the interwar clarified the promise of a dead body capable of converting urban landscapes, and mobilizing social differences into sites and subjects of new scientific practice. However, in practice, the reliance on the city itself for the definitions of the dead prevented the conceptualization of a colony-wide category of unclaimed dead, rendering the relationships between the incinerator and the corpses often remain limited to their regional meanings.

Session Organizer:
Zeinab Azarbadegan, Oxford University

Chair:
Zeinab Azarbadegan, Oxford University

045. Chemistry by Other Names: Tracing Chemical Knowledge Across Disciplines
Roundtable
11:00 to 12:30 pm - Friday 14 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon B2

In recent years, scholarship across science and technology studies has shown the centrality and utility of chemistry across arenas including food and agriculture, pharmacology, construction, sanitation, cosmetics, energy, ecology, and more. Despite this efflorescence of critical attention towards the ubiquity of chemical knowledge, perceptions both internal and external to the field reflect the idea that the history of chemistry is singularly focused on chemists working squarely within the discipline. Bringing together scholars from art history, environmental studies, sport studies, and the history of science, technology, and medicine, this roundtable illustrates how histories of chemistry can elucidate entanglements of political economy, knowledge production, aesthetics, design, social justice, and care. The presenters draw on case studies from East Asia to the Americas, including topics such as pesticide development and militarism; settler colonialism and photography; chemical production of building materials; performance-enhancing drugs; microbes and fermentation science; and medical epistemic pluralism. Across these active research areas, the scholars represented on this roundtable will address how to trace chemistry's versatility between disparate sites, as well as how to parse the (dis)continuities between the chemical sciences and vernacular forms of knowledge. Finally, the roundtable will interrogate the potential of destabilizing chemistry as a technical enterprise, moving beyond disciplinary definitions to understand chemical knowledge as encompassing a vast array of material transformations. The panelists aim to disabuse their interlocutors of any notion of chemistry's insular orientation, while demonstrating how chemical traces can reveal dependencies and interconnections fundamental to modernity.

Session Organizer:
Nikhil Joseph Dharan, University of Pennsylvania

Participants:
Victoria Lee
Jessica Varner
Siobhan Angus
JJ Strange, University of Wisconsin–Madison
David Singerman
Laura Martin, Williams College

046. Adding it Up: The Past and Future of History in the Mathematics Classroom
Roundtable
11:00 to 12:30 pm - Friday 14 Nov.
Sheraton New Orleans: Napoleon B3

Thirty years ago, the first class of the National Science Foundation-sponsored Institute in the History of Mathematics and Its Use in Teaching (IHMT) convened at American University to prepare mathematics faculty to incorporate more history into undergraduate mathematics instruction. Three cohorts over five years comprised about 120 mathematics faculty and historians of mathematics, who in turn formed a new generation of historically-informed educators and researchers in mathematics history. They further propelled the formation of new professional resources such as reading groups and scholarly society special interest groups. This panel explores the legacy of IHMT alongside other communities of mathematicians, historians, and educators who created spaces for the intersection of mathematics, history, and pedagogy. Of particular note is the refereed online journal MAA Convergence, established in

2004, which explicitly focuses on these intersections. The panel will also consider creative pedagogical techniques and traditions that have been developed for mathematics education, including theatrical and musical performance opportunities. The roundtable's guided discussion will brainstorm solutions relevant to both the past and the future: best practices for archiving accomplishments such as IHMT and strategies to foster ongoing efforts for incorporating the history of mathematics in the classroom.

Session Organizers:

Emily Hamilton, University of Massachusetts, Amherst

Brittany Shields, University of Pennsylvania

Participants:

Emily Hamilton, University of Massachusetts, Amherst

Brittany Shields, University of Pennsylvania

Amy Ackerberg-Hastings, MAA Convergence

Andrew Fiss, Michigan Technological University

Sloan Despeaux, Western Carolina University

Daniel Otero, Xavier University

047. Osiris Volume 40: 'Knowing Animals, Moving Animals' Roundtable

Roundtable

11:00 to 12:30 pm - Friday 14 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon C

Human societies often come to know the natural world by examining animals, even as animals, frequently both willful and animate, elude human grasps and challenge human aims. Animals and their movements have underpinned many methodological, moral, and epistemic dilemmas. Featuring a range of geographies, species, languages, and cultures, the articles in this volume broaden the view of the roles animals play in knowledge production processes. Organized according to three scales of animal movement (individuals, groups, systems), the twelve richly illustrated inquiries are situated in different time periods, from the sixteenth-century Ottoman Empire to the recent globalized past, and introduce varied forms, capacities, and politics of movement. The analytic attention to mobility deepens comprehension of animal agency and human–animal interactions in unexpected spaces, including airports, entertainment venues, living rooms, dirt roads, and waterways. Taken together, the case studies in this volume reconsider how, where, and by whom science is done.

Session Organizers:

Sonia Wigh, University of Cambridge

Lisa Onaga, Max Planck Institute for the History of Science

Participants:

Aleksandar Shopov, SUNY Binghamton

Rebecca Woods, University of Toronto

Samantha Muka, Stevens Institute of Technology

Ashton Wesner, Colby College

048. Sciences of Waste/Wastes of Science I

Organized Session

11:00 to 12:30 pm - Friday 14 Nov.
Sheraton New Orleans: Floor 4th Floor - Nottoway

This is the first of two sessions devoted to the longue durée history of waste in the West. The concept of waste underwent major transformations from the early modern period through various stages of modernity. This session focuses on the sixteenth, seventeenth, and eighteenth centuries. Across this time period, views of waste shifted dramatically. Throughout, however, the act of identifying something or someone as waste held great power. We might think of waste as a mundane object, identified with whatever our waste management systems contain. In early modernity, the identification of waste required a potent epistemic act that gained its power from the threats that waste seemed to pose to life. When famine stalked sixteenth-century English householders, they husbanded resources by reducing, re-using, and identifying alternatives. At the turn of the seventeenth century, new ideologies of development through projects caste the non-use of nature as though it were an active form of devastation (from Latin vastare, to lay waste). Many projects centered on identifying how something deemed already spent or useless could produce value. Alchemical notions concerning the redemption of matter encouraged experiments in transforming the residues of alchemical processes into new products, such as pigments or bath salts in seventeenth-century

Central Europe. In eighteenth-century Philadelphia, the re-utilization of human excrement and other forms of rubbish took on a new meaning as epidemic disease rendered a recycled resource into a source of disease, justifying attempts to eliminate rather than re-use waste. Yet many of these efforts, especially as they increased in scale or intensity, masked their own destruction of value and values.

Participants:

Cleansing the Streets: Water and Waste in Eighteenth-Century Philadelphia ***Keith Pluymers, Illinois State University***

Over the course of the eighteenth century, city authorities in Philadelphia had adopted multiple efforts to manage the city's streets, including paving, drainage, and the creation of city scavengers. One of the central goals of this effort was to ensure that streets were "clean." Through the 1780s this effort focused on the removal of "rubbish"—a broad category which included "mud," "dirt," "soil," "other filth," "shavings," "ashes," or "dung." Removal, however, did not mean elimination. Rubbish was a valuable commodity that helped to fund the city scavengers and was subject to regulations on collection and sale. After the initial outbreak of Yellow Fever in 1793, the meaning of rubbish began to shift from commodity to threat as a source of disease-causing putrefaction. As successive waves of Yellow Fever ripped through Philadelphia in the 1790s, the city's medical and civic authorities came to agree upon one potential solution—cleaning the streets. In this context, however, cleaning took on new meaning, requiring efforts not only to remove the list of physical materials from the street surface but also plans to alter the composition of the atmosphere. In turn, managing rubbish became not only a task for scavengers but also a call for the construction of new infrastructure—first pumps and, shortly thereafter, a steam-powered, pipe-connected water supply. The threat of epidemic disease helped transform rubbish from potentially profitable, if "incommodious" material, into a threat requiring new forms of cleaning.

Making Something from Nothing in Seventeenth-Century Dutch and German Alchemy ***Vera Keller, University of Oregon***

Today, the dominant meanings of waste are rather new ones, those that that the OED dates to 1678 ("Of materials, incidental products, etc.: Eliminated or thrown aside as worthless after the completion of a process; refuse") and 1836 ("the excreta of animal bodies"), respectively. For centuries beforehand, waste meant the opposite. Rather than filthy or worthless stuff, waste denoted emptiness (from Latin vastus), as in "the wastes of heaven," or vast, empty space. Emptiness in and of itself was not negative. It only became negative as the result of actions (human or otherwise) that devastated or laid waste, that is, that emptied a space of its valuable contents through destruction. How did waste shift from absence to presence? I explore changing ideologies of waste in the long seventeenth century, focusing on the nexus of alchemical views of matter and colonial development of land. A perfective view of nature set human industry as normative. In alchemical terms, humans were meant to complete the work of Creation by identifying hidden value and redeeming the dross or feces produced through alchemical processes. Thus, writing of wine lees or "faeces" in 1654, an English translation of Johann Rudolph Glauber criticized how after wine-making lees were often cast away "as unproffitablee wast," despite the fact that much profit in the form of vinegar, aquavit, and other products could be drawn from the lees. This alchemical view of the redemption of seemingly unprofitable matter begins to point to modern meanings of waste, although waste matter was defined in this context by the hidden potential for future profitability. Potential profit transformed the meanings of waste writ large. Inactivity could be equated with active destruction (nature devastated or laid waste) since the normative moral onus lay so heavily upon humans to redeem

nature. Entire landscapes, such as the English Fens or Virginian woods, were framed as devastated through inaction and awaiting destined future industry. Rather than nothingness, waste came to mean an opportunity not pursued, or as we might say, wasted. Unprofitable materiality became waste, awaiting its future redemption into profit.

Making Shift and Imagining Waste in Early Modern England ***Ayesha Mukherjee, University of Exeter***

The term “making shift” has long been familiar to historians of early modern England as a description of the coping mechanisms of the poor during periods of dearth and want. Yet, this term of remarkably indeterminate meaning signified unsettledness, untrustworthiness, and crime, as well as hard work and ingenuity. This paper will argue that these ambivalent connotations were, moreover, connected to the making of knowledge stimulated by conditions of dearth. It will examine how “making shift” acquired further nuance when allied to the pragmatic uses and meanings of waste in literary texts and practical manuals of the 1590s - a decade marked by acute crises of dearth, famine, and disease. I will look closely at the transformation of waste resistant practices as well as literary discourses of waste and recycling across the late Elizabethan and Jacobean periods, reading scientific methods and speculations alongside literary and metaphorical elaborations of waste. The paper aims to demonstrate the close alliance of the practical/scientific and the poetic in the early modern imagination of coping with waste.

Session Organizers:

Vera Keller, University of Oregon

Jeremy Greene, Johns Hopkins University

Chair:

Jeremy Greene, Johns Hopkins University

049. Astronomical Futures: The Waning Cold War and Imagined Futures of the Outer Worldly

Organized Session

11:00 to 12:30 pm - Friday 14 Nov.
Sheraton New Orleans: Floor 4th Floor - Oak Alley

Astronomy is categorized as an observational science. That is, what you can observe is what exists, directing historians of astronomy to focus on the practice of observation. Just beyond the horizon of historical invention is how astronomers must often develop predictions of the future of their discipline and their observational field, systems, and environments. This panel focuses on those times when astronomers become futurists. Each talk is rooted in the waning years of the Cold War period known for its influence on imagined political scenarios and futures. By shifting focus from histories of observing what exists in the universe to what astronomers imagine as their future, this panel reveals how the zeitgeist legal, social, and political influences of this period were incorporated into scientific and technological systems, environmental boundaries, and commutative and collaborative development. Each panelist will respectively explore this issue through the following questions: How do we create environments to detect unknown signals through legal instruments? How do we discern extraterrestrial communication? How do we imagine and design an asteroid threat monitoring system?

Participants:

CETI and the Cold War Politics of Communication ***Rebecca Charbonneau, American Institute of Physics***

This talk draws from my recently published book, Mixed Signals: Alien Communication Across the Iron Curtain, which traces the intertwined histories of radio astronomy, Cold War geopolitics, and the search for extraterrestrial intelligence (SETI/CETI). I will explore how, during an era defined by secrecy, surveillance, and ideological division, radio astronomers in the United States and the Soviet Union pursued a shared ambition: to detect and communicate with intelligent life beyond Earth. In doing so, they fostered surprising forms of scientific collaboration across political boundaries, even as their work remained deeply entangled with national defense priorities and global strategic

interests. This paper focuses on how efforts to construct universal languages for extraterrestrial communication—through mathematics, radio signals, and international conferences—were shaped by the challenge of communicating across geopolitical fault lines here on Earth. CETI offered a compelling vision of international cooperation, yet it was also susceptible to co-optation by state actors seeking technological and symbolic power. Drawing on archival research and oral histories, I will highlight how Cold War astronomers became both emissaries of scientific idealism and participants in broader structures of military and political authority.

Planetary Protection Requires Peace: The Spaceguard Asteroid Survey as Imagined Internationalism ***Matthew Stanley, New York University***

Astronomers in the last decades of the twentieth century pondered how to ameliorate a newly fashionable danger: a hypothetical asteroid or comet crashing into the Earth, destroying human civilization. There were a handful of observers looking for threatening rocks but their efforts were clearly inadequate. Instead, those astronomers began thinking about how to design an early warning system that would truly protect the Earth, what came to be called the Spaceguard Survey. They realized the system would only work with a future human civilization that was quite different from our current one. Part of this was hoped-for technological advances, but overwhelming their imaginations were political – only a truly international scientific community, exchanging information freely and efficiently, could safeguard our planet against cosmic interlopers. The conception and creation of the Spaceguard Survey spanned the late Cold War and the years just after, and this paper examines the shifts in what it meant to be "international" even as astronomers continued to insist on those values as being foundational to a properly warded future Earth. From informal personal connections across the Iron Curtain to a well-educated military to highly centralized data processing centers, astronomers imagined a variety of solutions for the mismatch between the timescales of cosmic impacts versus the timescales of human politics. The stakes of an asteroid apocalypse were global, so their efforts to prevent it had to cross borders as well.

Legal Shielding: Imagining Noise Mitigation Futures Through Land Use Regulation of Laboratory Environments ***Tiffany Nichols, Northeastern University***

Based on theoretical predictions of detectable radio signals, the National Radio Quiet Zone (NRQZ)—a 13,000 square mile quiet zone to abate interference at the Green Bank Observatory (GBO)—was created in 1958. The boundaries of the NRQZ along with radio frequency allocations held by the National Radio Astronomy Observatory (NRAO) centered both the then-contemptuous radio observatory and its future enhancements' ability to detect faint low frequency signals emitted by astronomical phenomena. This talk focuses on the expanded laboratory originally imagined at the creation of the NRQZ, which limited noise mitigation rights to those originating from structures affixed to the land, including radio broadcast and cellular antennae. However, in 1997, the deployment of the Iridium satellite communications system evaded what radio astronomers thought were robust protections of radio astronomy offered by the NRZQ. This proliferation of satellites meant that noise interference would also originate from the very environment–i.e., space–that GBO observed. Focusing on the evolution of noise mitigation required at GBO, this talk analyzes the scales of GBO's spatial environment that span the immediate observatory site, the surrounding populated areas contained within NRZQ, and space, particularly Low Earth Orbit that now hosts tens of thousands of satellites. This talk reveals that although the original creators of the NRZQ incorporated future imaginations for the expanded laboratory of GBO, radio

astronomers and policymakers' then-contemporaneous understanding of noise from a ground-based perspective generated loopholes in legal protections, failing to address noise emanating from space. This talk concludes that understanding noise mitigation as an assemblage of layers and scales encompassing the local and cosmic, even if unrealized, may result in robust, sustainable land use rights that can appropriately account for evolving noise-producing technologies.

Session Organizer:
Tiffany Nichols, Northeastern University

Chair:
Anna Doel, American Philosophical Society

Commentator:
Anna Doel, American Philosophical Society

050. GECC Listening Session

Roundtable
12:30 to 1:45 pm - Friday 14 Nov.
Sheraton New Orleans: Floor 3rd Floor - Poydras

During the GECC Listening Session, we invite all graduate students and early career scholars to join an open conversation about their experiences, concerns, and aspirations within the HSS community. This session is an opportunity to voice ideas, raise questions, and share feedback that will help GECC shape its programming and advocacy in the year ahead to better serve its members.

Session Organizer:
Claire Ann Votava, University of California, Los Angeles

Participant:
Mary Kate Wolken, University of Minnesota

051. Transnationalism and Science in Cold War Asia

Contributed Paper Session
2:00 to 3:30 pm - Friday 14 Nov.
Sheraton New Orleans: Floor 4th Floor - Bayside ABC

Participants:

"Good Trees are Fast-Growing Trees": South Korea's Soil Conservation and Reforestation in the 1950s *Jaeyoung Ha, Tsinghua University*

In this paper, I revisit the mid-1950s as the watershed moment in the environmental history of Korea, when forestry shifted from colonial-era exploitive forestry to forestry for permanent preservation. I first show how U.S. and South Korean forest scientists and foresters selected three species to reforest the country—Pinus rigida, Alnus sibirica, and Robina pseudoacacia—valuing their soil retention, growth rate, and fuel efficiency to address the estimated disappearance of South Korean forests in 25 years. Next, I highlight how the U.S. funded the South Korean government to establish a system in which the state purchased seedlings of these three fast-growing species from communal nurseries owned by local Village Forestry Association (VFA, or sallimgye) units. Finally, I illuminate how the South Korean government distributed these tree seedlings to other VFA units around deforested areas, and motivated locals to make their living and fuel from these trees. In this way, my presentation highlights how the forced cooperation and contestation over tree use and forest management between American scientists, South Korean state actors, and villagers contributed to the reforestation of South Korea's mountains. Ultimately, this presentation argues that this nuanced relationship reversed the declining trend of South Korea's forest stock for the first time in decades in 1957, putting an end to centuries-long exploitive forestry in the Korean Peninsula.

Entangled Diseases: How Malaria Influenced Singapore's Dengue Control Program in the 1960s *Timothy Sim, University of Cambridge*

Historians of international health often criticize "vertical" health campaigns for focusing on one specific disease in isolation and ignoring the presence of other diseases. Yet many historians of medicine study a single disease at a time, without always examining how diseases are related to each other. This paper tries to break out of that mold by highlighting how the control of one disease, dengue fever, was inextricable from that of another

disease, malaria, even though the two were transmitted by different mosquitoes. Building on Maurits Meerwijk's (2020) argument that the histories of dengue and yellow fever were "entangled", I argue that the origin of dengue control in 1960s Singapore cannot be separated from its history of malaria control. Firstly, malaria control in British Singapore established the mosquito as a target of public health interventions and generated important anti-mosquito expertise. Secondly, it was the return of malaria in 1964 that first formalized dengue control. Malaria had been suppressed in Singapore so successfully that this surprising resurgence prompted a thorough reorganization of vector control services that ironically drew more attention to dengue. Lastly, in the early years of the dengue control program, health officials sometimes still cited malaria as a reason to support the program, illustrating the slippage between malaria and dengue. In the final, more speculative part of the talk, I consider whether dengue is typical or unique in its entanglements with other diseases and what that might mean for the historiography of medicine.

The Politics of Pacific Science: Communism in the Malayan Rubber Industry c. 1945-1960. ***Fiona Williamson, College of Integrative Studies, Singapore Management University***

The Rubber Research Institute of Malaya (RRIM) was founded in 1929, at least two decades after the rubber industry in the British colony had come to dominate the developing market but it quickly came to dominate research into the commodity for Britain's tropical colony. This scientific research was governed chiefly by the needs of the industry and desire to make British rubber not just a global competitor but to retain its position in the face of growing competition from the US and that nation's new ventures in South America and Africa. Once the Malayan plantations had been recovered from the Japanese Occupation of 1942 to 1945, the British government and RRIM pursued a policy that was integrally tied to nationhood, imperialism and, somewhat ironically given the economic rivalry between the UK and US, premised on a shared anti-communist agenda. This paper explores these competing narratives within the Cold War forum. It looks at the pursuit of science as an economic and political tool but also the place of rubber in the US-UK war against communism, specifically in the context of the Malayan Emergency of 1948-1960. It was here that rubber was at the heart of the fight. Rubber plantations were targeted as symbols of British rule by the anti-colonial resistance while buying British rubber was marketed a symbol of patriotic duty. At the same time, the British sought to undercut the American industry while seeking to share the same political goals.

052. Popularizing 20th Century Sciences

Contributed Paper Session

2:00 to 3:30 pm - Friday 14 Nov.

Sheraton New Orleans: Floor 3rd Floor - Borgne

Participants:

Fashionable Fossils: Measuring Trends in the Publicity of Paleontology and Dinosaurs with Magazine Front Covers ***Victor Monnin, John Jay College, CUNY***

The public interest for paleontology and dinosaurs is usually presumed to have been constant through time since the early days of the field. Because of their remoteness and, for some of them, exceptional size, dinosaurs and other prehistoric animals have been conceptualized as inherently fascinating. The public interest for paleontology and dinosaurs has been naturalized. This paper presents evidence showing that, far from being a natural and uniform phenomenon, the public interest in paleontology and dinosaurs has gone through many phases that point toward a much more complex history between paleontology, the public, and printed science media. This evidence was produced through a quantitative and qualitative analysis of front covers published by American popular science magazines, such as Scientific American, Science News, and National Geographic.

The occurrences of covers featuring paleontology and dinosaurs were recorded and graphed to visualize publicity trends between 1845 and 2024. Despite limitations, this approach provides useful results to sequence and interpret historical trends in the publicity of paleontology and dinosaurs since the mid-nineteenth century. It also allows to better understand when and how dinosaurs became synonymous with paleontology in popular culture. Finally, it showcases the value of methodologies coming from magazine studies to investigate the interplay between science, audiences, and media outlets.

Film Animals: The Generation of Meta-Audiovisual Spaces for Natural History in Fiction and Documentary Films ***Carlos Tabernero, Institute for the History of Science (iHC) - Universitat Autònoma de Barcelona***

Animals have always been prominent protagonists in symbolic systems of all kinds that human beings use to produce explanations of the world and of our spatiotemporal relationship with the context in which we live. The interventions of animals in human stories, whether documentary or fiction, reflect at the same time that build the context in which they are produced, as well as their relationship with our ways of understanding, conceptualizing, and relating to what we call nature. These stories, above all when articulated through images, are always related to the exhibition regimes that refer to both interspecific and intraspecific interactions. Cinema, a set of technologies deeply linked to ideas of progress and power, is an essential constituent of the multilayered mechanisms of generation of visual and experiential sociocultural spaces for natural history, particularly in urban contexts. Similar to what happens in zoos, cinema provides, with the required feeling of safety, audiovisual access, among other aspects, to animals that, under normal conditions, would remain invisible or inaccessible to most of the target audiences. In this work, we historically analyze representations of animals both in documentary and fiction films, and how these representations constitute a meta-audiovisual experience of natural history and the concomitant relations between human and non-human animals.

Imaginary Futures: Science, Fans and Fictions ***Jim Endersby, University of Sussex***

Various early-twentieth-century publics responded enthusiastically to new ideas about biology (including Mendelian genetics and eugenics, but more often the now, largely forgotten Mutation Theory). Science fiction writers and readers, socialists, feminists and utopians are among those who seized on the amazing new possibility of rapid – potentially controllable – evolution. This paper will explore the idea that the ways in which science escaped from the lab to be appropriated for various (often wildly imaginative) ends might be understood by thinking about interpretation and appropriation as forms of fandom. Studying the adventures of scientific ideas after they escaped the control of their disciplinary (and historical) gatekeepers acknowledges the agency of non-scientists and gives us a richer picture of how science becomes part of public culture. In a period when Science Fiction fans often described themselves as “science fans”, and shared their fascination with policy makers and modernists novelists, new biologies provided a range of tools with which to imagine alternative futures.

Katherine Dopp, Early 20th Century Women Writers, and the Evolutionary Epics that Introduced Children to the Origins of Human Life on Earth ***Elizabeth Fabry Massa Hoiem, University of Illinois at Urbana-Champaign***

This paper examines a forgotten but influential popular science writer for children, Dr. Katherine Elizabeth Dopp, John Dewey’s doctoral student and University of Chicago faculty. Her Industrial and Social History Series (1903-1930) became a popular US textbook for

introducing prehistoric life to primary school children. Each book covers one stage of human economic development—The Tree Dwellers, The Early Cave-Men, The Later Cave-Men, The Early Sea People, The Early Herdsmen, The Tent-Dwellers, and The Early Farmers—with fictional child protagonists who invent fire and domesticate animals, complete with teacher lesson plans and extensive reading recommendations from anthropology and paleontology. Dopp adjudicated between expert theories to foreground prehistoric women as technological innovators. While teachers embraced Dopp's books for enlivening classrooms and states created entire curricula around her books, her portrayal of matriarchal families and human evolution attracted controversy in the decade before the Scopes Trial (1926). Following Dopp's success, Margaret Wells, Lucy Sprague Mitchell, and Henrick Willem van Loon wrote sweeping historical dramas of geology, evolution, and prehistory—what Bernard Lightman calls "evolutionary epics"—but designed to teach children the historical origins of global industrial economies. I argue the rapid expansion of teaching colleges created opportunities for women, who while discouraged or barred from academic careers in male-dominates sciences (biology, paleontology) instead earned doctorates in education and wrote carefully researched children's books. Other women authors—Margery Quennell, Heluiz Bigelow Washburne, and Adeline Linton—coauthoring epics with husbands with greater professional visibility. These books shaped the earliest ideas people learned about evolution, paleontology, and prehistoric life but has been overlooked in histories of popular science, which focus on Hunter's Civic Biology (1914) or H. G. Wells's Outline of History (1919-1920).

053. New Books in the History of U.S. Health
Authors Roundtable
2:00 to 3:30 pm - Friday 14 Nov.
Sheraton New Orleans: Edgewood

New Books in the History of U.S. Health
Participants:

Health Freaks: America's Diet Champions and the Specter of Chronic Illness *Travis Weisse, New Mexico State University*

Health Freaks tells a new history of modern diets in America that goes beyond the familiar narrative of the nation's collective failure to lose weight. I instead explore how the popularity of diets grew alongside patients' frustrations with the limitations and failures of the American healthcare system in the face of chronic disease. I argue that millions of Americans sought "fad" diets--such as the notorious Atkins program which ushered in the low-carbohydrate craze--to wrest control of their health from pessimistic doctors and lifelong pharmaceutical regimens. Drawing on novel archival sources and a wide variety of popular media, I show the lengths to which twentieth-century American dieters went to heal themselves outside the borders of orthodox medicine, and the subsequent political and scientific backlash they received. Through colorful profiles of the leaders of four major diet movements, Health Freaks demonstrates that these diet gurus weren't shady snake oil salesmen preying on the vulnerable; rather, they were vocal champions for millions of frustrated Americans seeking longer, healthier lives.

On Hunger: Violence and Craving in America from Starvation to Ozempic *Dana Simmons, University of California, Riverside*

In this book, Dana Simmons explores the enduring production of hunger in US history. Hunger, in the modern United States, became a technology—a weapon, a scientific method, and a policy instrument. During the nineteenth century, state agents and private citizens colluded in large-scale campaigns of ethnic cleansing using hunger and food deprivation. In the twentieth century, officials enacted policies and rules that made incarcerated people, welfare recipients, and beneficiaries of foreign food

aid hungry by design, in order to modify their behavior. With the advent of ultraprocessed foods, food manufacturers designed products to stimulate cravings and consumption at the expense of public health. Taking us inside the labs of researchers devoted to understanding hunger as a biological and social phenomenon, On Hunger examines the continuing struggle to produce, suppress, or control hunger in America.

The Care of Foreigners: How Immigrant Physicians Changed US Healthcare ***Eram Alam***

For more than 60 years, the United States has trained fewer physicians than it needs, relying instead on the economically expedient option of soliciting immigrant physicians trained at the expense of other countries. In this talk, I will examine the first large scale migration initiated during the Cold War with the passage of the Hart-Celler Immigration and Nationality Act of 1965. This bill expedited the entry of Foreign Medical Graduates (FMGs) from postcolonial Asian nations and directed them to provide care in shortage areas throughout the country in exchange for legal status. Although this arrangement was conceived as a temporary measure, it has become a permanent feature of the US medical system with foreign physicians comprising a quarter of the total physician labor force. This neocolonial dynamic has entrenched a stratified healthcare system; foreign physicians are directed to America's marginalized communities, thereby disincentivizing organized medicine from addressing the structural conditions that perpetually produce labor shortages. The ubiquitous and integral presence of foreign physicians not only reveals the racialized operations of US medicine, but it also makes visible how the political economy of care writ large operates in our globalized present.

054. Public Health in the Late 19th Century

Contributed Paper Session

2:00 to 3:30 pm - Friday 14 Nov.

Sheraton New Orleans: Napoleon A1

Participants:

Scientific Controversies in the Construction of a Public Health Discourse to Contain the Influenza Epidemic of 1890 in Mexico ***David Lautaro Marchant Cavieres, Virginia Tech***

Between 1890 and 1892 Mexico suffered an epidemic called Russian influenza, which we now know was probably caused by a type of coronavirus. Due to its high mortality, the disease attracted national attention and several civil society organizations proposed solutions for its containment. Our research identifies the main public health debates to confront this epidemic through a documentary analysis of 10 Mexican newspapers published between 1890 and 1892. The results indicate that public health discourses were based on two opposing epistemological currents: miasmatic and microbiological theory. The difference between the two theories lay in the object postulated as the disease's source. According to the miasmatic theory, putrefied air produced the disease and it was proposed to relocate cemeteries, cremate corpses or prohibit excavations. In the microbiological theory, it was believed that microorganisms were responsible for the disease and measures of social isolation, public hygiene and fumigation were proposed. Interestingly, part of the government's actions aimed to regulate harmful agents according to both miasmatic and microbiological theories. The research shows that the dispute between theories at the level of public debate was resolved on the basis of a questionable integration of contradictory knowledge. Finally, we argue that the scientific controversy between theories was minimized by the political need to find a solution to the advancing epidemic. Thus, the research contributes to the understanding of the dynamics of public health debates in the face of epidemic threats.

"Roaming Among the Santhals and Wild Beasts of the Forest": History of Smallpox Epidemics and Vaccination Operations in

Chotanagpur and Santal Parganas in Colonial India (1865-1900) ***Indranil Pramanik, Indian Institute of Technology Madras; John Lourdusamy, Indian Institute of Technology***

Smallpox was one of the most prominent diseases in nineteenth-century India. Unlike Cholera and Plague, Smallpox was more widely prevalent. While multiple historical works have dealt with various aspects of Smallpox, there are almost no works on the peripheral areas like Chotanagpur and Santal Parganas in Eastern India. Therefore, this paper will explore the history of Smallpox in these regions concerning its regional specifications, such as the prominence of tribal populations and challenging landscapes. Moreover, by studying Smallpox among tribal communities, this paper will contextualise and challenge existing stereotypes like tribal isolation and "Sanskritization." The paper will argue that diseases like Smallpox were already prominent among the tribal communities and constantly exchanged between the tribals and the "mainland" inhabitants. Similarly, while some scholars like G.S Ghurye, M.N. Srinivas, and S.C. Roy (specifically in the context of the Chotanagpur) regarded tribal adaptability and exchange of ideas as "Sanskritization", this paper reasons that such adaptabilities were not very straightforward actions and hardly qualified for "Sanskritization." A significant portion of the paper will deal with the colonial measures to counter the diffusion of Smallpox within the "fractured state" framework – as discussed by Sanjoy Bhattacharya, Mark Harrison, and Michael Worboys. By doing so, the paper will examine how the "Colonial" actions/opinions were even more fractured in the peripheral areas where the economic interests were limited, vaccinating personnel complained about the special difficulties of "roaming among the Santhals and wild beasts", and the local people constantly challenged the rule. Such issues compelled the state to follow a dialectical and simultaneous deployment of tools of suppression and negotiation with regard to the local population and existing social hierarchies.

'The Cholera-Defying Hero,' Aubrey Stanhope's 1892 Experimental Laboratory Journey Meets the Press ***Kalman Rotstein, Binghamton University***

Histories of science typically perceive the relationship between the laboratory and the public as unequal. Scientists, in this dynamic, draw authority from the laboratory's controlled environment and use that to present ideas to the public fully-formed. This paper highlights a case-study where the laboratory extended itself into the public sphere, and the boundaries between the two were blurred. In 1892, Waldemar Mordechai Haffkine developed a cholera vaccine at the Pasteur Institute in Paris. His first human trial was conducted by the journalist Aubrey Stanhope who travelled from Paris to Hamburg, which was in the midst of a cholera epidemic. Stanhope's experimental journey was widely debated and discussed in the American and British press. In this way, instead of being under laboratory control, the first human trial for the cholera vaccine was open to public debate and influence. Most scholars depict the public interaction with laboratory science as heavily mediated through popular scientific journals. By contrast, this paper argues that just as laboratory scientists were establishing clearer boundaries for their sphere of expertise, the fact that the first human trial of the cholera vaccine occurred outside the control of the laboratory shows how newspapers provided the public with a space to critique, evaluate, and judge scientific authority.

055. Translation and Interpretation in the Early Modern World

Contributed Paper Session
2:00 to 3:30 pm - Friday 14 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon A2

Participants:

Encyclopedia as Interpreter: How the Erru Catalogue of Flowers Sustains an

Ecologically Aware Poetic Experience
Siyu Xie, Johns Hopkins University

This paper explores how a botanical encyclopedia, as a taxonomic practice and scientific documentation, sustains an ecologically aware poetic experience. The painter and poet Wang Mian (1287-1359), renowned for his ink plum paintings, has a celebrated poem: "The tree beside my inkstone-washing pool/ Its flowers bloom with faint traces of ink/ They seek no praise for fine colors/ Only to leave pure fragrance filling the universe." Readers may assume that it is talking about Wang Mian's own craft of ink plum painting, because most plum blossoms in reality are either pink or white, instead of ink colored. However, the late Ming encyclopedia Erru Catalogue of Flowers, compiled by scholar Wang Xiangjin (1561-1653) documented an actual "ink plum" variety with flowers "black as ink," and it records that the variety is possibly created through grafting techniques with Chinaberry trees. This taxonomic record disrupts the conventional literary analysis of the ink plum poem as a piece of writing dedicated to art. The encyclopedia itself, incorporating numerous poetic entries alongside botanical information, represents an ecological approach to knowledge where literary and scientific understandings coexist and mutually enrich each other. While it is impossible to know whether the painter was describing the botanical reality or an artistic work, the encyclopedia entry complicates the layers of the poetry, making it closer to the material reality. Furthermore, this case suggests a reciprocal influence: the grafting techniques may have been developed specifically to manifest the ink plum painting genre in botanical form. This study illuminates how premodern Chinese scientific documentation practices not only preserved botanical knowledge but also produce alternative interpretive frameworks that continue to transform our understanding of texts and contexts.

Sacrobosco finds English: The Four Translations, Their Authors, Their Sources, and Their Visual Features ***James Brannon, Independent Scholar***

Vernacular editions of Sacrobosco's cosmographic primer "De Sphaera" (ca. 1220) were published in 16th-century France, Germany, Italy, Spain, and Portugal. But where was England's contribution to this growing international effort in celestial education? It too was there, but persisted only in isolated manuscripts. It took another 400 years before a direct Latin-to-English translation of De Sphaera found its way into print publication. I will discuss the four translators who authored English editions of Sacrobosco's most famous work – Anthony Ascham (1527), William Thomas (ca. 1550), Thomas Van Cleve (1921), and Lynn Thorndike (1949) – and address which source(s) they employed, along with their works' visual aspects. What makes these translators unique is their use of clearly identifiable Latin sources. Their final products evolved from manuscripts (for the first three) to a print book (Thorndike), while their visual splendor devolved from Ascham's spectacular early effort (large format diagrams, charts, maps, volvelles – all in color) to Thorndike's diagram-less modern volume in black & white. Surprisingly, there is no evidence that members of this foursome were aware of one another's translations – a striking fact, particularly for the famously sleuth-like Thorndike. Further, the first three translators employed 16th-century print volumes of "De Sphaera" to produce manuscripts (print → manuscript), while Thorndike's 20th-century atavistic approach, ironically, engaged medieval Latin manuscripts to craft the first English-language hardcover (manuscript → print). Better known English-language print works from the 16th century that are only "based-on" De Sphaera, such as Robert Recorde's 1556 "The Castle of Knowledge," Richard Eden's 1561 "The Arte of Navigation," and Thomas Hill's 1599 "The Schoole of Skil," do not have readily identifiable Latin sources. Considerations on why the manuscripts of

Anthony Ascham and William Thomas evaded transformation to print, and whether undiscovered English translations might exist, will conclude the talk.

Interpreting the World: Physics, Astronomy, and Translation in Tokugawa Japan *Lewis Bremner, University of Cambridge*

This paper explores the work of the Japanese scholar and interpreter Shizuki Tadao, and in particular his three-volume manuscript, Rekishō shinsho (‘New Book on Calendrical Phenomena’), which he completed in 1802. The book was nominally a translation of two collected books by the Oxford astronomy professor John Keill, Introduction to True Physics (1702) and Introduction to True Astronomy (1718). In Rekishō shinsho, Shizuki presented to Japanese readers for the first time detailed explanations of several of Newton’s central ideas, including optics and universal gravitation, and covered a wide range of concepts in astronomy and physics including the fundamental forces, planetary motion, particle physics, and the extent of the universe. Having used a Dutch translation of Keill’s work, he also gained renown among contemporary scholars as the foremost expert in European languages of his day, a reputation that outlasted his early death in 1806. However, in many places in Shizuki’s book the content differed from Keill’s text, sometimes radically so. Previous scholarship on the physical sciences in Japan has described these divergences as mistakes or mistranslations that, despite the quality of the work, reflect its underdeveloped grasp of science and adversely affected the circulation of scientific knowledge from Europe. By contrast, this paper considers these divergences as points at which Shizuki’s intentional, coherent, and critical engagement with knowledge of nature can be observed most clearly, revealing his practices of not only translating ideas, but also testing, reformulating, and creating them in pursuit of a better understanding of the universe.

056. Expedition Sciences

Contributed Paper Session

2:00 to 3:30 pm - Friday 14 Nov.

Sheraton New Orleans: Floor 3rd Floor - Napoleon A3

Participants:

"How a Brigade can Tackle an Eclipse": Norman Lockyer, the Royal Navy, and the 1900 Eclipse Expedition *Beatrice Honey Steele, University of Exeter*

Using recently unearthed visual archives at the Norman Lockyer Observatory, this paper will explore the eclipse expedition of 1900, which took Lockyer and his observing party to Santa Pola, Spain. The lantern slides and negatives of the Santa Pola campsite reveal a fascinating network of relations between scientists, sailors, photographers, soldiers, tourists, and amateur astronomers. Upon examination of these archival materials, the sheer extent of the Royal Navy's investment in these endeavours becomes clear. However, the reasons for this intense interest from the British naval establishment have been somewhat neglected in social histories of eclipse expeditions. The Norman Lockyer Observatory's photographic collections include much documentation of Lockyer's astronomical training programme for the sailors at his camp. These images, depicting men undertaking drills in solar observation, as well as engaging with cutting-edge instruments and new camera technology, can help us to understand more about why the Royal Navy increasingly devoted significant funds and manpower to supporting eclipse expeditions.

Nature and Empire in Translation: An Egyptian Expedition to Paris *Yotam Tsal, Dan David Society of Fellows, Tel Aviv University*

In 1826, Muhammad Ali Pasha sent a delegation of Egyptian intellectuals to Paris under the leadership of the imam and writer Rifa’a a-Tahtawi. Over five years, these intellectuals immersed themselves in the study of European nature, science,

governance, and culture. Their itinerary included visits to natural history museums, botanical gardens, and technical schools, while their intellectual output ranged from translations to original reflections in Arabic and French. This paper reinterprets the mission as a site of epistemic exchange centered on the natural world. Moving beyond prevailing intellectual and political readings of the journey, I foreground how nature—its classification, cultivation, and commodification—became a terrain of negotiation between Egyptian intellectuals and French scientific institutions. How did a-Tahtawi and his companions understand and use European natural knowledge, and in what ways did they critique or reshape it? What meanings did natural history, agriculture, and animal life carry in this moment of imperial convergence, and how were these meanings inflected by colonial hierarchies and local ambitions? Framed against the backdrop of French colonial expansion in North Africa, this paper situates a-Tahtawi's journey within the broader workings of scientific imperialism.

Pursuits of Science in the Frame of Empire: Baltic German Naturalists and the Russian Exploration of Northern California ***Sandra Rebok, University of California San Diego / Center for US-Mexican Studies***

The Russian Empire's pursuits on the Pacific Coast of North America, led to an array of scientific exploratory endeavors in this area, at a moment when also the United States revealed increasing interests in establishing a presence on the West Coast. Many of the travelling naturalists and artists from Imperial Russia, who carried out their investigations in the fields of geography, botany, zoology, geology, meteorology, and ethnology, were of Baltic German origin. Among the most prominent examples are the physician and biologist Georg H. von Langsdorff, the naturalist Adelbert von Chamisso, the entomologist zoologist Johann F. Eschscholtz and the explorer Ferdinand von Wrangel. This paper looks particularly at the area of today's northern California and explores (1) how the Russian strategic interests in California, as attested by the Russian-American Company (1812-1841), or Fort Ross (established in 1812), were tied to natural science pursuits promoted by the Russian Empire; (2) in which ways these German naturalists interacted with the representatives of the Spanish Empire in California; (3) to what extent their scientific work circulated among competing empires and (4) in which way those Russian endeavors – political and scientific –constituted a concern for Thomas Jefferson and his plans for a westward expansion of the young nation.

057. Spirits and Disease in Medieval and Early Modern [European] Medicine

Contributed Paper Session
2:00 to 3:30 pm - Friday 14 Nov.
Sheraton New Orleans: Napoleon B1

Participants:

Against Miasma: Air at the Intersections of Medieval Medicine and Meteorology ***Thomas James Banbury, University of Cambridge***

In recent scholarship, terms such as Guy Geltner's 'healthscaping' and Paul Warde's 'environing' have sought to emphasize the entanglement of the premodern body with its environments, and the co-production of these environments, both deliberately and unintentionally, between human, animal, and vegetal agents. However, aside from the work of Sandra Cavallo on early modern Italian science, this refocusing onto more-than-human histories of the environment has yet to take account fully of the role of the atmosphere within these systems of thought and practice. This paper examines what the cross-reading of medicine and meterology can reveal about the boundaries of atmospheric knowledge in 13th and 15th century Europe. Tracing 'bad air' in both meteorological and physiological literature yields two important insights into premodern understandings of the atmosphere/body interface. First, I argue against the imposition of 'miasma' as a blanket description of air-based pathologies. The sources instead point to a

huge range of dangers from changes to the air, both in its substance and its qualities. By reading medicine through meteorological material, I suggest that the material economies of disease-generation were the same as those which produced atmospheric ‘disorders’ such as thunderstorms and meteors. Secondly, by focussing on the qualitative changes to the air, I argue that there was a greater emphasis than previously recognised on bodily disease and atmospheric disorder being the result of changes in fluid flows and substantive texture, in line with Michael Stolberg’s critique of the focus on issues of ‘balance’ and ‘equilibrium’ in the history of medicine.

Demons, Minds, Poisons, and Words: Speculative Ontologies of Disease Transmission in Germany a Century and a Half before Germ Theory ***Elliot Mertz, Johns Hopkins University***

One major desideratum of late 17th century iatrochemistry was an explanation of communicable disease. Communicable disease became a particularly interesting thema for iatrochymical speculation because it promised a liminal space between the organically structured internal body and the chemically chaotic mechanical environment. While explicitly rejecting as underdetermined Cartesian explanations reliant on poisonous materia or on volatilities in otherwise stable mechanical systems, chymists in Saxony and Prussia submitted a plurality of alternatives. In doing so, they drew from Helmontian and Becherian chymistry, commitments to organic entelechies, and their experiences as practicing chymists and medizins. These speculative explanations ranged from chemically-described interactions between substances within and without the body, to impositions of unsuitable physical and mental objects in the mental processes controlling circulation of the blood, to invasive mind-like entities (which Hoffmann in a 1737 dissertation posits might be equivalent to demons). Importantly, these speculations were never meant to be mutually exclusive; instead, the category of communicable diseases might admit a multiplicity of ontologically distinct causes. This paper draws from dissertations written by iatrochymical thinkers in Halle associated with the Fridericiana and the Franckesche Stiftung; most notably Stahl, Hoffmann, and Juncker; as well as an autographic corpus of letters which attest to the ways that they (as well as Thilo and Richter) put their speculations into practice through diagnoses and chymical prescriptions. What is most fabulously interesting is how these thinkers deployed chymical, emotional and environmental interventions in tandem to treat what they saw as vastly diverging disease vectors.

Spirits, Vapors, and Volatile Substances in Early Modern Medicine and Alchemy ***Elisabeth Moreau, University of Cambridge***

In early medicine, physiological processes were described as transformations involving the formation of “spirits” and “vapors” due to the action of heat within the body. This conception was grounded in the authority of ancient physicians and philosophers, particularly, Galen of Pergamon (129-216) and Aristotle (fourth century BC). Interestingly, the medical understanding of spirits underwent significant interpretations in the early modern period. The alchemical philosophy of the Swiss physician Paracelsus (1493-1541) provided new insights into the formation of spirits and their use in therapy. Accordingly, bodily transformations came from the coagulation of spirits into bodies thanks to three alchemical principles, namely, Salt, Sulphur, and Mercury. In turn, these spirits as volatile substances could be extracted by distillation to make powerful drugs. In this paper, I will explore these views in the medical philosophy of the German physician Daniel Sennert (1572-1637). As will be shown, Sennert's explanation of spirits in Galenic medicine and Paracelsian alchemy also applied to pharmacology, especially the distillation of metals and minerals for drug making.

058. Nature, Locality, and the Polemics of Equivalence in the Global Plant/Commodity Trade

Organized Session
2:00 to 3:30 pm - Friday 14 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon B2

As plants began to circulate to new parts of the globe in the early modern world, people drew parallels between known and unknown substances for a variety of reasons: to make sense of their properties, to persuade others to purchase them, or to look for divine signs. The search for equivalencies became a key feature of the colonial epistemological project, providing a site for contestation over competing visions of a plant's place in the emerging global medical, economic, and symbolic order. For some, asserting a substance's equivalence across contexts was an essential part of its commodification, brushing away differences in locality, nature, and the people involved in production. For others, denying equivalence provided a way to highlight products' distinctiveness, either due to their own properties or the history and labor behind them. This panel's presentations explore how equivalence functioned as a strategy for assigning—or denying—value in global plant exchange, and what role it played in processes of commodification. It brings together case studies that trace the search for equivalents across a range of settings, from the altar to the garden to the billiard table. In these cases, the quest for equivalence not only shaped relationships between plants from different regions but also blurred the lines between animal and plant, the natural and the artificial. Equivalence was not just a question for natural philosophers, but also for traders, physicians, priests, cooks, and gardeners, among others. By examining equivalence from multiple perspectives, this panel raises fundamental questions about the role of different people and groups in shaping the terms of international commodity exchange.

Participants:

Balsams in the Early Modern Colonial World ***Marlis Hinckley, Johns Hopkins University***

Balsam, or bálsamo, has been used across Eurasia as a medicine and ceremonial substance since ancient times. Besides enjoying a long-standing place in pre-modern medicine, balsam was (and remains) an essential ingredient in holy chrism, the scented oil used by Catholic priests in a variety of religious ceremonies. However, 'balsam' is far from a precise term, as it can refer to the aromatic sap of a broad range of trees and shrubs. Consequently, debates over which gums count as 'balsam' carry major economic and religious stakes. This presentation focuses on the sixteenth-century adoption of what today are sometimes called 'West Indian balsams': aromatic gums extracted from trees native to the Americas. Focusing on documentation regulating the trade in these balsams, this presentation will trace debates between physicians on the comparability of Old World balsams with American ones. It will also examine ecclesiastical edicts on the use of 'Western balsam' in holy chrism. Finally, it will consider the relationship between the category 'balsam' and indigenous American categories for tree gums, including copal. In doing so, it will address broader epistemological questions about how contact between Europe and the Americas affected early modern thinking about natural categories in both a religious and medical context.

A Laborer Like No Other? Crafting Visions of Cochineal and Indigeneity in the Eighteenth-Century Atlantic ***Diana Heredia-López, The University of Texas at Austin***

Between 1751 and 1783, the red dye bearing insect cochineal, reached its highest peak of production in the Mixteca and Central Valley of Oaxaca. The intensive labor, specialized knowledge about the ecology and life cycle of the parasite and its plant host along with the purported secrecy of both the Spanish colonial government and cochineal producers made this dye notoriously difficult to transplant and cultivate. And yet throughout the eighteenth century, naturalists and entrepreneurs in the broader Atlantic world evaluated the

viability of introducing cochineal cultivation in places like South Carolina and Jamaica. This presentation thus seeks to explain how opposite visions about cochineal coexisted in this era of intensified cochineal exports: one that saw cochineal as a hyperlocal commodity best obtained through Indigenous labor and another that held on to the possibility of translating this specialized labor into enslaved economies and societies. Drawing on the visual and print culture produced by gardeners, colonial officials, and naturalists, it highlights the centrality of Indigenous cultivators' representations in evaluating the viability of introducing cochineal cultivation outside New Spain. In doing so, it shifts the focus from botanical and microscopic representations of cochineal as a natural history specimen and instead focuses on the longer process of creating fixed and manageable ethnic identities and commodities in the Atlantic world.

Global Circulation, Local Displacement: Vegetable Ivory and Extractive Science in Ecuador's Long Nineteenth Century ***Ana Hidrovo-Lupera, Pennsylvania State University***

This presentation traces the global journey of the tagua nut (Phytelephas aequatorialis)—a plant native to Ecuador's rainforests and once marketed as "vegetable ivory"—to explore the entangled histories of biopiracy, labor exploitation, and scientific commerce. Gaining international prominence in the mid-1800s as a substitute for animal ivory, the tagua nut became central to the button-making and toy industries in Europe and the United States. In Ecuador, the trade was managed by a European multinational company that concealed the plant's true origin, promoting the belief that vegetable ivory came from Africa. This strategy reinforced its perceived equivalence with animal ivory while obscuring Ecuador's role in its production. At the same time, the company displaced Afro-Ecuadorian communities in Esmeraldas and imposed exploitative labor regimes. By centering Ecuador's position within global trade and scientific networks, this paper shows how imperial science relied on extractive practices and the marginalization of local communities, raising broader questions about the ethics of knowledge production and resource appropriation.

Session Organizer:

Ana Hidrovo-Lupera, Pennsylvania State University

Chair:

Marlis Hinckley, Johns Hopkins University

059. Thinking with Primates

Contributed Paper Session

2:00 to 3:30 pm - Friday 14 Nov.

Sheraton New Orleans: Napoleon B3

Participants:

"From Jungle to the Laboratory": Pastorian Chimpanzees, French Empire, and the Developent of Experimental Primatologu in the U.S. ***Marion Constance Thomas, University of Strasbourg***

Robert Yerkes is a pivotal figure of American primatology. His life and work have been well documented. Less is known about the international dimension of his career, which includes a collaboration with the Pastorians, especially Albert Calmette. In the early 1920s, Calmette, who developed the BCG vaccine, an anti-tuberculosis vaccine, launched a chimpanzee facility in Kindia, French Guinea to test it on primates, before moving on to humans. Meanwhile, Calmette was aware that chimpanzees could be a bargaining chip to attract international funding, especially American one. While the Pastorians set up a collaboration with Yerkes, it was Yerkes' colleague, Henry Wieghorst Nissen, who benefitted most from the arrangement. Nissen travelled to Kindia to observe chimpanzees in the wild, and also collect a group of animals to supply the Yale Laboratories of Primate Biology (YLPB). Drawing on Nissen's unexplored notebooks and correspondence, as well as scientific publications, I reconstruct the life trajectory of those chimpanzees, especially a female baby called Kambi, from her capture in the jungle of Guinea to her

enrollment in psychological and toxicological studies at the YLPB. Concurrently, I show how Nissen's dedication to his animals, his willingness to individualize them (such as naming them) clashed with the ways in which he fashioned them into experimental subjects. I argue that the Guinean chimpanzees were good vehicles for Yerkes' campaign to establish primate stations in the US, to promote Nissen's career, and eventually contribute to the thriving of primate studies at the YLPB in the late-1930s.

Neanderthals at the Boundary: Species and Difference between Man and Ape ***Emily Kern, University of Chicago***

What do Neanderthals tell us about what it means to be either a human or an ape, and how has the answer to that question changed over time? This paper tracks the historical transformations in the interpretation of Neanderthals as intermittently—and sometimes simultaneously—apes, primates, ex-apes, humans, and people from the first discovery of the Neanderthal specimen in 1856 through the expulsion in 1909 and then the readmittance of the Neanderthal to the human evolutionary lineage in 1955. Examining Neanderthals as a kind of boundary object (following Star and Griesemer, 1989), this paper focuses on negotiations around Neanderthals on the ape-human boundary and their placement near or far from Homo sapiens and nearer or farther from other species of non-human primates—the apes, gibbons, Old World monkeys, etc.—both spatially and temporally on the evolutionary family tree. Neanderthals were marginalized by various sets of actors during their deepest period of interpretive eclipse: they were always positioned on a boundary, but with different interpretive implications depending on how that species boundary was drawn and how the evolutionary lines of descent were constructed. Rather than recreate the entire timeline of Neanderthal interpretation, this paper will instead examine disputes over Neanderthals as more simian or more human and what these disputes tell us about different readings of morphology, behavior, and evolutionary relationships between apes and humans over the first century of Neanderthal research.

The Linguistic View of Life: Generative Grammarians' Apish Modern Synthesis ***Max Fennell-Chametzky, Stanford University***

In the second half of the twentieth century, largely in the United States and during the 1960s and 1970s, psychologists and linguists engaged in a heated struggle over a series of psychological-primatological experiments that aimed to impart American Sign Language into chimpanzees, gorillas, and bonobos. The episode quickly morphed into a wider scientific debate over the nature of humanness and the nature of science. This paper examines one aspect of that debate, specifically how highly skeptical linguists crafted a biological theory of language to rival the Neo-Darwinist claims of their psychologist-primatologist interlocutors. In their declaration that a strong discontinuity characterized the cognitive relationship between man and ape, American linguists flirted with a radical anti-evolutionism and were indeed portrayed as anti-Darwinian. Yet far from encompassing a naïve rejection of twentieth century biological theory, this paper argues that linguists engaged in a productive (re)reading of modern synthesis texts and interpreted them toward their own ends. Drawing on published material and unpublished archival sources, this paper situates not only the typical linguistic leader Noam Chomsky but the overlooked linguist, neuroscientist, and physician Eric H. Lenneberg at the heart of this practice. Lenneberg's work articulated a theory of biological behavior rooted in strict speciation, closed fitness landscapes, and environmental epigenetics which posited a natural world of atomic individuals. Analyzing this work pushes us as historians toward a recontextualization of the Cold War behavioral sciences, asking us to (re)centralize linguists' relationships

to the life sciences.

060. Modernizing Enlightenments in the Global History of Science

Contributed Paper Session
2:00 to 3:30 pm - Friday 14 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon C

Participants:

Divination, Science, and Enlightenment in Eighteenth-Century France *Michael Lynn*

Eighteenth-century France experienced a continued interest in and innovation around magical practices even as scientific practices continued to develop and establish themselves. This paper examines various forms of divinatory practice - such as oneiromancy, cartomancy, geomancy, and chiromancy - with an eye toward demonstrated how attempted to present themselves as rational and scientific. Max Weber's idea of disenchantment no longer dominates the field of the history of magic but this leaves open the question of how people in the eighteenth century understood their simultaneous push for something they saw as modern alongside their ability invest time and money in magical practices. As Michael Hunter has argued for Britain, magic was not displaced by science but by freethinkers, among others. I will argue for the continued centrality of magic to people's lives even as they also invested in scientific activities. Scholars tried to eradicate the overly credulous belief in magic (high magic, divination, and prestidigitation) while others sought to invest those same beliefs with greater reason and a sense of modernity. This paper will argue for the centrality of magic to the development of modernity.

Emergence of Biology as a Distinct Scientific Discipline in Late Ottoman Empire and Fikri Tevfik's Hüceyre Hayatın Esası (Cell: The Essence of Life) *Seriyye Akan, Binghamton University SUNY*

The modernization of Ottoman science began in the early 18th century, before the concept of "biologie" first appeared in a study by Lamarck in 1801. During the 19th century, biology evolved from natural history into separate disciplines, including botany, zoology and human physiology, in Europe and North America. A similar progression occurred within the Ottoman Empire as well. Natural history courses offered in the high schools during the 19th century laid the groundwork for the establishment of separate courses in botany and zoology at the first Ottoman university, Darülfünûn (House of Sciences), in 1900. The initial professors at this university utilized translations of zoology and botany books by European scientists in their lectures. Fikri Tevfik, a young graduate of the natural sciences department at Darülfünûn, published a book titled Hüceyre: Hayatın Esası (Cell: The Essence of Life) in 1911 in Istanbul. In addition to the knowledge he acquired from Darülfünûn lecturers, particularly Esad Şerafeddin Bey, Fikri Tevfik drew heavily from the works of 19th century French botanists such as Gaston Bonnier, Georges Colomb and Édouard Lefèvre. As Fikri Tevfik and his intellectual circle envisioned a comprehensive social transformation and debated the boundaries of modernization within the context of 19th-century scientific advancements, they focused on three main subjects: the law of matter (madde kanunu), evolution (tekâmül) and the theory of cell (hücre nazariyesi). This paper contextualizes this overlooked book within the framework of late Ottoman scientific production and also argues that its hybrid nature reflects various aspects of Ottoman modernization. Furthermore, this study aims to analyze late Ottoman experience of scientific production in biology, with respect to its development as a distinct discipline in the 19th-century Europe.

Quest for Enlightenment: The Making of "Scientific Dispositions" in China, 1861-1935 *Xiaoxing Jin*

This article investigates China's scientific evolution from the Self-Strengthening Movement to the onset of the Second Sino-Japanese War, focusing on the roles of traditional Chinese values, Western

influences, and indigenous initiatives in shaping “scientific dispositions.” It traces the rise of a pragmatic, utilitarian approach to science, driven by the dual imperatives of national security and modernization, set against the backdrop of Western imperialism and internal instability. Key developments such as the reframing of “gezhi,” the overseas education movement, and the formation of the Science Society of China illustrate a shift toward empirical science as a tool for state survival and progress. While scientism facilitated modernization, it often sidelined ethics and aesthetics in favor of deterministic approaches. This study, set within the framework of global knowledge transmission, explores the communication between Western and Chinese scientific traditions, emphasizing cultural exchange, imperialism, and global influence, while analyzing the evolution of scientific practices and their role in late Qing reform movements, where national pride, survival, and modernization converged.

061. Sciences of Waste/ Wastes of Science II

Organized Session

2:00 to 3:30 pm - Friday 14 Nov.

Sheraton New Orleans: Floor 4th Floor - Nottoway

This is the second of two sessions devoted to the longue durée history of waste in the West. This session focuses on the political ecology of waste in the nineteenth and twentieth centuries in the United States. In these three cases, attitudes towards waste were imbued with powerful emotions and moral imperatives, even as the classification of waste changes over time. In the nineteenth-century hospital, "extravagant" use of medical supplies constituted a moral failing for nurses. In mid-twentieth century Pennsylvania, end-of-pipe pollution became reclassified as a hazard to humans and a public health concern. By contrast, medical plastic disposables in the late twentieth century shifted from a medical setting to an environmental one. Taking on new roles in the dump, they endured as both vectors of infection and sources of petrochemical toxins.

Participants:

“Extravagant, Unaccountable Use”: Nursing Practice, Hospital Supplies, and the “Waste” Problem ***Amanda Mahoney, Case Western Reserve University / Dittrick Museum of Medical History***

This paper explores the concept of waste as “extravagance” and the moral framework of thrift within nursing practice in the U.S. between 1880 and 1930. Understanding how thrift as nursing ethics shaped nursing and hospital practices is key to understanding the transition to single use disposable supplies later in the 20th century, a change that defines our understanding of hospital waste. Economy in the use of supplies was a key component of nursing education during the early decades of professional nursing. Instructors and nurses in leadership positions understood thrift as a shared professional value, a key aspect of good nursing practice as reflected in nursing school curricula, textbooks, and clinical literature. Nurses used the term “extravagance” to describe waste in nursing practice, including the overuse of supplies and the loss of expensive equipment, such as glass thermometers due to carelessness. Instructors framed “extravagant” behavior as poor nursing practice and at times, a moral failure. The concept of thrift and the importance of avoiding “extravagance” were considered a tenet of nursing ethics by many nurses. Examining more closely the concept of waste as “extravagance” in nursing practice reveals that while this moral framework of thrift significantly shaped practice and education, it failed to enforce economical use of supplies or curtail waste within the hospital. In response to this failure, nurses championed the standardization and centralization of supply management, laying the groundwork for the transition to single use disposables during the late 20th century.

Redefining and Repositioning Acid Mine Drainage in Pennsylvania, 1945-1970 ***Elizabeth Bennett***

Pennsylvania’s place in the global energy economy has come at great cost to both its

people and its environment. This cost has manifested in environmental and human health hazards such as acid mine drainage (Casner 2003, Acharya & Kharel 2020), fires in mines or on culm banks (Shafer 1979), and detrimental changes to topography (Burger and Zipper 2002) and biodiversity. These hazards were, and still are, managed by mine reclamation – a form of ecological restoration that restores the economic and ecological productivity of inactive and abandoned mines. In the mid-20th century, the coal-producing regions of the Commonwealth experienced changes in mine productivity, market dynamics, and popular attitudes towards coal mining (and its aforementioned costs) that reconfigured relationships between the State and civil society (Dublin and Licht 2005). As the Commonwealth's government sought to balance the continuity of the coal industry with the need to conserve natural resources and protect its citizens from poor health outcomes caused by coal mining and combustion, the Commonwealth sought to integrate acid mine drainage mitigation projects into water quality management projects, which were in turn integrated into reconfigurations of the Commonwealth's public health institutions (Bennett forthcoming). In this paper, I examine how advocates affiliated with the League of Women Voters advocated for the reclassification of acid mine drainage (AMD) from a natural side-effect of mining to a form of industrial pollution, and how this reclassification shaped how the State and civil society re-articulated boundaries between environmental health and human health between 1945 and 1970.

How to Dispose of the Disposables? Single-Use Plastics and the Paradox of Medical Waste ***Jeremy Greene, Johns Hopkins University***

In August of 1962, a hospital manager wrote to the advice column of Hospital Management with an embarrassing problem. "We are having a great deal of difficulty in disposing of our disposable syringes and needles," he complained, and it was beginning to have human costs. Specifically, if just thrown away, "we find that garbage and refuse contractors are taking these items out of the trash barrels and are using them for other purposes." The newest plastic syringes meant for single-use were stubbornly durable. Since polyethylene "will not snap, is extremely resistant to breaking, and has been sterilized as many as 27 times without breaking," their continued availability after disposal created an "easy accessibility of these sets to narcotic addicts because when the hospital uses them a single time they throw them away." Single-use medical plastics created entirely new qualitative and quantitative problems of disposal, especially used plastic syringes. These novel kinds of used objects were understood as doubly toxic: first in the potentially-infectious organic materials they contained after clinical use, and second as a source of toxic petrochemical derivatives as they decayed in landfills or were burned in incinerators designed for other materials. "Disposing of disposables," the president of the American Hospital Association complained in 1967, "is a new, and surprising, problem." Single-use medical devices were supposed to make healthcare safer. Yet as the volume of hospital waste doubled, then doubled again, and continued to increase at an exponential rate, hospital managers, infection control professionals, and sanitation engineers wondered aloud: what could be done with these unhealthy new forms of waste increasingly generated in the name of health? Using archival collections, FOIA requests, and trade journals, this talk revisits how multiple stakeholders sought to measure and reckon the individual and collective costs incurred at the dawn of the era of throwaway medicine.

Session Organizers:

Vera Keller, University of Oregon

Jeremy Greene, Johns Hopkins University

Chair:

Vera Keller, University of Oregon

062. Water and Power in the History of Science

Contributed Paper Session

2:00 to 3:30 pm - Friday 14 Nov.

Sheraton New Orleans: Floor 4th Floor - Oak Alley

Participants:

Floods in the Po River Basin in the 19th Century: A History of Land Management and Risk Communication in Post-Unitary Italy ***Marco Bresadola, University of Ferrara, Italy***

The paper deals with the history of water-related disasters in the Italian north-east area, where the major river of the country - the Po - has its delta. It focuses on how the management of the territory was organised in post-unitary Italy, the role of the technicians in this organization, and what was, if any, the communication of related risks to the population. In particular, the paper focuses on some major events in this history, which are the floods that hit the lower basin of the Po in the latter part of the 19th century, and discusses the controversies that developed about the causes of the disaster, the responsibilities of the actors involved in the management of the territory, including technical experts, and the measures to prevent and mitigates future risks for the population. The topic of the paper thus intersects environmental history, the history of natural risks and the history of expertise and scientific communication.

The Climate of Ancient History: Historicizing the Nile in Nineteenth-Century Egypt ***Anna Simon-Stickley, Freie Universität Berlin***

This talk centers on attempts to historicize the Nile and how these reconstructions were used to predict future floods under British colonial occupation. Throughout the second half of the nineteenth century, various khedival and colonial irrigation engineers, government scientists, travelling naturalists, and antiquarians drew on geological as well as archaeological evidence to question whether the height of the flood, the rains causing it, and the rate of sediment accumulation had declined since the times of the ancient Egyptians – thus infusing geo-history with orientalist temporal models of decline, stagnation, and revival. Around 1850, for example, the Armenian-Egyptian irrigation engineer Yusuf Hekekyan collaborated with a British geologist and conducted borings to infer the annual accumulation of Nilotic mud per century. Others studied ancient monuments to infer environmental and climatic changes: The scholar and minister Ali Mubarak, in his 18-volume geographic work al-Khitat al-Tawfiqiyya al-Jadida, compiled all known flood levels from Nilometer readings and archival documents. British scientists working for the colonial Survey Department drew on Mubarak's work, added data from temples now high above the water line, and tried applying Eduard Brückner's theory of period climate changes. In the same journal, the Egyptian astronomer and meteorologist Mahmoud El-Falaki, attempted to predict future floods by looking at climatic data from East Africa and others still contributed Egyptological evidence. This episode shows how knowledge of the Nile's past dynamics circulated unevenly between Egyptian and colonial elites, as well as between different disciplines, and how tightly connected the changeability of the Egyptian environment was to the ability to change it through imperial irrigation projects, such as the Aswan dam.

Do Settlers Dream of Electric Fields? Power, Agriculture, and Social Engineering in Mandatory Palestine ***Tal Golan, University of California, San Diego***

This paper will revisit the electrification of Palestine, a subject that has attracted considerable scholarly attention at the intersection of science, colonialism, and Middle East studies. I will advance three central arguments. First, the electrification of Palestine was the culmination of an early Zionist hydroelectric vision—one centered on dams, water canals, and hydropower stations—as the infrastructural backbone of a prosperous, modern Jewish

settlement. Second, this hydroelectric project was driven less by urban or industrial aspirations and more by ambitions for agricultural transformation and irrigation. Third, the Zionist impetus behind electrification was rooted in a broader project of social engineering: the creation of a resilient Jewish peasantry envisioned as the foundational stage in the evolution of a healthy national body.

063. Beyond Botany: Plant Knowledges in Asian Studies

Organized Session

4:00 to 5:30 pm - Friday 14 Nov.

Sheraton New Orleans: Floor 4th Floor - Bayside ABC

New and critical scholarship on the history of plants and the practices of botany has called attention to the foundational erasures, silences, and re-writings upon which natural history and western botany were instituted under imperialism (Subramaniam 2024; Gutierrez 2025). This fundamental critique of the classificatory projects of the early natural sciences has aided historians of Asia, and of Asian empires, to engage with the question of epistemic pluralism and develop analyses of unconventional archives. While we accept erasure as an historical artefact of colonial epistemology, as historians studying the complex relationships between language, empire, and plant knowledge in Asia, our interests in multilingual archives have led us to excavate and understand epistemes of the plant sciences that have been hitherto unexamined. We find an abundance of plant knowledge-making in Bengali, Hindi, Persian, Turkish, and Urdu. As such, our scholarship builds on and complements work in Asian studies that focuses on questions of translation and the co-production of knowledge traditions and the multilingual intermediaries who work across them. We foreground the varied intellectual labours of local knowledge-producers who were not directly subject to European botanizing endeavors, or remained at a distance from them, circulating among particular communities and audiences in separate yet related ways. Here we take seriously ordinary names of plants in family traditions, oral traditions, therapeutic and culinary uses, sensory and imaginative roles, and metaphors of plant life that emerge from Asia's abundant regional languages. On occasion, we also find trajectories of plant knowledge that are related and yet branch away from the region's classical Persinate and Sanskritic discourses. As such, we explore models of plant history and multispecies relations across Asia that are generative of social, intellectual, and cultural history and yet exceed the epistemic framework entailed in 'botany' as a disciplinary practice.

Participants:

When Images Speak: Plants, Flower Breeding, and Visual Culture in the 17th-Century Ottoman Empire ***Duygu Yildirim, University of Tennessee, Knoxville***

Early modern Ottoman scholars were reluctant to incorporate botanical illustrations into their expansive botanical compilations, due to the high cost of manuscript illustrations and the epistemological risks posed by potentially misleading depictions. However, this scholarly skepticism toward plant imagery began to shift over the course of the seventeenth century, driven by the expansion of global trade and the inclusion of lay people in the botanical marketplace. In Istanbul, anonymous artists produced single-page illustrations of indigenous plants, serving as visual advertisements for their commercial circulation. Simultaneously, the burgeoning artisanal-scientific practice of breeding new flower varieties increasingly relied on illustrations to authenticate and validate their cultivators' expertise. This paper examines the emergence of competing visual epistemologies at the intersection of art, commerce, and scientific inquiry, highlighting a neglected dimension of the Ottoman history of science on the eve of global commercialization.

Mediating Medicine: Indian Avicennians and Plant-Knowledge in the Majalla-e Tibbiya ***Sabrina Datoo, Mount Royal University***

The Majalla-e tibbiya (MT) was an Urdu language medical periodical (1903-1914), published by the Madrasa Tibbiya (est.1889), the first modern educational

institution devoted to the study of Avicennian medicine in South Asia. The MT contains discussions of plant-knowledge in articles, editorials, and reader letters throughout its years of publication. Rather than treating discussions of plant-knowledge within its pages as ready-made natural objects, this essay draws attention to how Indian Avicennians mediated the unruly and heteroglossic nature of plant-knowledge in the early twentieth century. Because the MT was funded through the private capital of subscribers its discussions were reflective of the broad range of reader interests, rather than state-driven projects. Moreover, the medical periodical as a new genre of scientific communication created a space of public conversation to juxtapose inherited discursive traditions with new projects of plant exploration, whether of economic or medical utility, or multilingual classification. Illustrating a continuity of early-modern intellectual instincts, the contributors to the MT neither accepted the linguistic imperialism of the eighteenth century, nor did they circumscribe plant-knowledge to medieval discourses of botany (‘ilm al-nabatat), pharmacopeia (aqrabadin) or pharmacy (‘ilm al-adwiya). As such, the MT offers us an instance of a generative discourse on human-plant relationships before its saturation with swadeshi emphases in the inter-war period or the later imperatives of Nehruvian science. This paper seeks to both empirically register the epistemic pluralism of this particular historical moment, and articulate an analytical position appropriate to it.

Approximation, Proximity, and Production: Plant Knowledge and Peasant Talk ***Utathya Chattopadhyaya, University of California Santa Barbara***

Reams of ethnographic writing, translated songs, folk knowledge, couplets, idioms, proverbs, and sayings about agricultural practices that were collected through the period of British colonial rule exist today as mediated sources into the world of peasant production and the folklorization of agrarian knowledge. This paper explores the history of plant knowledge in Bengali and Hindustani corpuses of agricultural sayings to situate what kinds of minutiae constituted ordinary “peasant talk” about different plant species, agricultural variants, and cultivation practices. Unlike medicinal plants which have deep historical imprints in South Asian traditions of knowledge and systems of medicine, garden and field plants like betel, plantain, potato, and mustard occupy registers of knowledge that themselves shifted with seasons, size of the plot, and climatic phenomenon. This paper argues how the different kinds of approximation and proximity that shaped such registers, and corresponding agrarian practices of planting and plants, help extend and nuance the possibilities of multispecies history in colonial South Asia.

Waters of the Earth: Indo-Persian Agronomy in Early 20th century Afghanistan ***Marjan Wardaki***

This paper traces the history of hydrological and agricultural knowledge in early twentieth-century Afghanistan through the Rāhnamā-yi Qataghān va Badakhshān (1923). Positioned between imperial cartographic aspirations and local epistemologies of subsistence, the text is a rare instance of agronomic documentation written not for colonial surveillance, but for an internal administrative and geographic understanding of the region’s northeastern provinces during the pivotal era of decolonization in Afghan history. Detailing the glacial and rain-fed sources of rivers flowing from the Pamir Mountains into the Amu Darya, the work registers a vocabulary of zira‘at (cultivation) that encoded localized forms of ecological intelligence, such as lalmi, a system of rain-fed agriculture practiced in hilly terrain. These longstanding practices emerge in this geography not only as an agrarian technique but as a linguistic and spatial trace of glacier-fed river systems, rain-fed agriculture, canal-building, and bridge infrastructure. Most existing historical narratives about land, agriculture, or water

management in the region were rendered through British, Russian, or other imperial archives. Attuned to the ways in which agricultural practices were embedded in hydrological rhythms, this paper examines the Rāhnamā as a source of non-colonial scientific writing—where topographic particularity and seasonal timing coalesce into a grammar of rural endurance. In attending to a source that lies beyond the imperial archive and its botanical ambitions, this paper asks how we might read for rural environmental knowledge in regional texts that did not seek to "know" plants, but to live with them.

Session Organizer:
Marjan Wardaki

Chair:
Marjan Wardaki

064. Press and Audiences in Mexico (18th-20th Centuries)

Organized Session
4:00 to 5:30 pm - Friday 14 Nov.
Sheraton New Orleans: Floor 3rd Floor - Borgne

The periodical press was conceived as a suitable tool for the circulation of scientific knowledge in a space that was shared, at the same time, with some fine arts contents. Its emergence in New Spain's eighteenth century made it possible for science to open up to citizens who, in the transition to the nineteenth century, became audiences that consumed both leisure and instructive contents and who, at the beginning of the twentieth century, contributed to the demarcation between the literary and scientific spheres. The objective of this organized session is to show how the process of demarcation of the scientific press in Mexico went hand in hand with the expansion of a public sphere that diversified according to the uptake of different contents. That is to say, throughout the period studied, audiences congregated in microspheres defined by specialized interests, which can be seen in how the same publications acquire content and formal characteristics that differentiate them from each other. To account for this process, we will use the gaze of the social and cultural history of the press.

Participants:

Press and Citizen Science in the New Spain Gazettes of the 18th Century ***María Eugenia Constantino Ortiz, Universidad Nacional Autónoma de México***

This paper reflects on the connection between community, science, and the press, which has existed in the Western world for over two hundred years. By examining the periodical publications produced in New Spain in the late 18th century, I show how one aspect of the construction of scientific knowledge was driven by the public posing of problems and questions that sought solutions from diverse sources. The contemporary terms crowdsourcing and citizen science are used here to analyze these communication practices, materialized in various convenings, which sought the participation of individuals, not necessarily scholars, but capable of contributing to the construction of a community-based response with local nuances.

Definition of the Aesthetics of Science in Memorias y Revista de la Sociedad Científica Antonio Alzate ***José Daniel Serrano-Juárez, Instituto de Geografía, Universidad Nacional Autónoma de México***

This paper addresses the process of defining a scientific aesthetic in 19th-century periodical publications. Through an analysis of the content and layout of the Memoirs and Journal of the Antonio Alzate Scientific Society, I will demonstrate how aesthetic canons were formed that give science objectivity, neutrality, and independence from other disciplinary fields and news related to the social life of the organization.

Audiences of Mexican Scientific Journals (1900-1950) ***Rosa Dalia Valdez Garza, Instituto de Investigaciones Bibliográficas - UNAM***

Academic science, as a stage of knowledge production in Mexico, began in the 1950s, according to information from the Historical Atlas of Mexican Science (AHCM). Academic journals aimed at a specialized audience, as we know them today, began to take shape from this stage.

In contrast, many scientific journals that appeared during the first half of the 20th century were aimed at audiences that gathered for science, not only to update knowledge, but also for professional or union interests, and even to disseminate their academic and social activities. In some cases, the content and formal characteristics of these scientific journals reveal their hybridization with products of the daily, political, literary, and cultural press. Some seem to have the mold of the press, while others are profiled towards the journal as a product of scientific publishing practices. They were aimed at audiences seeking content for their instruction, but also to inform themselves about events in the social and working life of groups of professionals, and even as a space to disseminate literary texts by their members, and different journalistic genres, not only textual, but even caricature. Based on panoramic research in which almost 500 Mexican scientific journals of the 20th century were identified, we will present, for the first time, particular cases of some that exemplify their different audiences. The starting point is a sample of scientific journals from all areas of knowledge that emerged from the end of the stage of institutionalization of science (end of the 19th century) and the beginning and development of the pre-academic science stage (1912-1950).

Session Organizer:

José Daniel Serrano-Juárez, Instituto de Geografía, Universidad Nacional Autónoma de México

Chair:

Luz Fernanda Azuela, Instituto de Geografía - UNAM

065. Residues and Afterlives of Chemical and Biological Weapons Programs

Organized Session

4:00 to 5:30 pm - Friday 14 Nov.

Sheraton New Orleans: Edgewood

This panel examines the broadly defined residues and afterlives of chemical and biological weapons (CBW) programs, with an emphasis on the political, cultural, environmental, and legislative afterlives of the American program. This panel aims to demonstrate that the consequences of CBW preparedness, research and development, testing, transport, storage, and decontamination materialized in various forms, from gas mask readiness and its implications in Hawaii during World War II, to testing mishaps and their political and environmental consequences at the height of the Vietnam War, to the environmental complexities in decontamination efforts for live biological agents at Pine Bluff Arsenal in the early 1970s. This panel presents papers from across the major stages of the rise and fall of the offensive CBW program and treats its afterlives and residues as historically significant to broader political, diplomatic, and military history, environmental history, and the history of science and technology. Across the arc of the program's development and demise, biologists and chemists, activists and civilians, political representatives and correspondents, and military and national security officials reckoned with the residues and afterlives of CBW readiness, testing, and decontamination in ways that historians are recently investigating.

Participants:

Patchwork Protection: Gas Masks, Chemical Fear, and the Militarization of Hawaiian Civilians during World War II
Peter Thompson, Michigan State University

As a part of a panel on the afterlives of chemical and biological weapons, I aim to expand the categorical limits of "chemical weapons" by revealing the ways in which a protective tool like the gas mask encouraged a growing perception of a chemically dangerous world among Hawaiian civilians in the 1940s. My presentation will provide a brief historical overview of gas mask distribution and use in Hawaii during World War II. The United States military began to distribute gas masks to all Hawaiian civilians in December 1942, only days after the Japanese attack on Pearl Harbor. The attack produced a perceived need for immediate chemical protection that led to piecemeal distribution and production of makeshift civilian masks. Immediate

problems included the need for protective devices that fit children and the potential for an improper (i.e. not gas-tight) fit on Asian faces. Nevertheless, through homemade mask production and aggressive gas mask drilling, uniquely enforced through the declaration of martial law, the territorial government and the U.S. military essentially succeeded in making the gas mask an important (albeit reviled) tool in the performative civilian mobilization of Oahu. This then established both a functional and emotional Hawaiian relationship to gas masks that lives on in the memory of racial inclusion and exclusion under martial law and in a sense of environmental danger that is, at times, reproduced by the presence of volcanic fumes. Finally, I wish to put this story in conversation with what historian Sheldon Garon has called World War II's transnational culture of civil defense. By briefly comparing the Hawaiian and German experiences with the civilian gas mask, I intend to reveal commonalities in the militarization of civilians through a protective device that inspired a sense of communal belonging through technological exclusion in the face of atmospheric danger.

"Dark Military Corners": Sheep, Nerve Gas, and the Afterlives of Open-Air Chemical and Biological Weapons Testing in the U.S. ***Andrew Kishuni, Johns Hopkins University***

In March 1968, the U.S. Army chemical and biological weapons (CBW) testing installation at Dugway Proving Grounds, Utah, allegedly killed 6,000 sheep with VX nerve agent by accident, a mishap that caused a political firestorm on Capitol Hill. Little-known congressman Richard D. McCarthy of Buffalo, New York, launched a crusade to inquire about the incident, which unveiled a sprawling and secretive weapons complex that many liberal Democrats felt imperiled environmental health and national security. What ensued was a contentious, but forgotten, public and political battle over the place of the U.S. CBW program and weaponized science in foreign policy and domestic security. These events culminated in the Nixon administration's consequential decision to terminate offensive CBW development and open-air testing in November 1969, laying the policy foundations for the Senate ratification of the 1925 Geneva Protocol and the 1972 Biological and Toxin Weapons Convention (BTWC). This paper examines the legislative and political afterlives of the Skull Valley sheep incident in Utah and its impact on science policy at the highest levels of U.S. government. This paper focuses on McCarthy's two-year long campaign to rid the nation of its CBW arsenal and the government's eventual renunciation of open-air testing of CBW agents in the domestic U.S., which altered the strategic posture of Cold War America. Drawing from primary environmental and scientific studies, military reports, congressional records, activist documents, and declassified executive branch national security files, this paper argues that the afterlife of CBW testing in the U.S. extends beyond environmental contaminants. Domestic environmental and political pressures played just as prominent a role in the American renunciation of CBW as détente.

Residual Microbes: Environments and Environmentalisms in the "Decontamination" of the American Biological Weapons Arsenal ***Adriana Fraser, University of Pennsylvania***

After President Richard Nixon announced the end of the American biological weapons (BW) program in 1969, the Army was left with the question of what to do with its BW munitions and agent stocks. Nixon had ordered these materials "destroyed," but this was easier said than done. Munitions would need to be disassembled and the "agent" they contained (dried anthrax, tularemia, botulism, shellfish toxin, and Venezuelan equine encephalitis) would need to be not just discarded, but killed. In this paper, I explore the "decontamination" of the US Army's biological weapons stockpile at

Pine Bluff Arsenal (PBA), Arkansas, in the early 1970s. Specifically, I explore the environmental dimensions of these events. I center my inquiry on two major questions. First: what does it mean to "decontaminate" when the "contaminant" is alive? Environmental historians have explored the history of toxic environments, but what changes about these stories when a toxin is a living microbe? Killing dangerous pathogens like anthrax at scale requires the use of hazardous chemicals like formaldehyde. Under what conditions do the hazards posed by microbes outweigh the hazards of chemical contamination? Second: how did the political and social context of the early 1970s shape these events? As I will show, the destruction of munitions and agent stocks at PBA was highly publicized. In addition, because of the newly established Environmental Protection Agency (EPA), the Army's planners were required to produce an environmental impact statement for the process of destroying BW stocks. Given these facts, to what extent was the PBA "decontamination" a performative exercise of new American environmentalism? In answering these questions, I explore not only the processes that undergirded the PBA "decontamination" but the residues that were left behind.

Session Organizers:

Andrew Kishuni, Johns Hopkins University
Adriana Fraser, University of Pennsylvania

Chair:

Alison McManus, Johns Hopkins University

Commentator:

Susan Lindee, University of Pennsylvania

066. Zoonotic Entanglements: Histories of Diseases, Cultures, and Attitudes in Asia

Organized Session
4:00 to 5:30 pm - Friday 14 Nov.
Sheraton New Orleans: Napoleon A1

Asia has been an important theater for the co-evolution and entanglement of human-human and human-nature relations since before antiquity. A historically minded review of peoples, animals, environments, disease patterns, and cultural attitudes towards outbreaks of zoonotic diseases would provide an unprecedented look at recent human history as a story of interspecies entanglements. Drawing on perspectives from cultural studies, paleopathology, and paleoanthropology, this panel examines how the past and future of zoonotic diseases can expand the vocabulary and toolkit we use to study human history. The three papers featured in this panel will investigate (1) the symbolic transformation of the Chinese body in American popular culture during the Third Plague Pandemic (1855-1895); (2) varied methods available to identify the historically overlooked and underdiagnosed Q fever in China and the challenges of looking for clues in historical texts; and (3) what high-resolution archeological data can tell us about paleo-syndemics and population health in Neolithic and Bronze Age northern China, with implications for understanding human-animal and disease, and social dynamics. We ask: How have zoonotic diseases shaped human society and human-animal relations? How have humans built resilience through adaptation, medicine, and public health policies? And how might historical inquiry prepare us for future zoonotic disease outbreaks and pandemics such as COVID-19, HIV/SIV, and bird flu?

Participants:

You Are What You Eat: Food as Ontology in the Time of Plague *Jiangtao Harry Gu, Hobart and William Smith Colleges*

The Third Plague Pandemic (1855-1959), originating in Yunnan, China, marked a global moment of epidemiological crisis and zoonotic panic. As the plague spread across continents via trade routes, Chinese laborers—instrumental to colonial mining, railroad construction, and sugar production—were cast not only as victims but also as vectors of disease. This paper examines how the Chinese body is portrayed as a contagion in American popular culture, focusing on widely circulated visual campaigns against Chinese labor of the late 19th and early 20th centuries. This period also witnessed the beginning of modern microbiology, marked by Louis Pasteur and Robert Koch's contributions to the germ theory of

disease, which laid the foundation for the Swiss-French physician Alexandre Yersin's successful identification of the causative bacterium Yersinia pestis in Hong Kong in 1894. Despite significant advances in scientific knowledge about disease transmission, popular imaginations of contagion continued to misrepresent the plague as a food-borne disease. Drawing from case studies of political caricatures, children's books, and advertisements that portrayed the Chinese as a rat-eating race, this paper argues that such representations framed the disease not merely as an issue of unsanitary living conditions but as a collapse between eating and ontology: to consume rats was to become rats. Anthropologists have long described food as a site of boundary-making between the self and the other. But the materials examined here suggest something more absolute and transformative—a symbolic digestion in which zoonotic engagements are imagined to be capable of erasing the boundaries between species.

Hidden Q Fever in China: History, Paleopathology, and Modern Science ***Christine Jones***

Q fever, or Query fever (Coxiella burnetii infection) is a worldwide zoonosis, first identified in Australia in 1937 and not reported in China until 1950. Even though Q fever epidemics in Europe in the 2000s drew global attention and post-Covid clinical reports in China and the United States show that Q fever is widespread, medical practitioners are still ignorant of the disease, with delayed diagnoses proving fatal. Likewise, medical historians and paleopathologists remain unaware of Q fever and are simply not looking for its signs and symptoms, leaving its past unknown and etiology unstudied. While it does leave detectable signs on the skeleton, due to its late scientific discovery and symptoms which mimic other bacterial zoonoses, Q fever is often diagnosed as a 'fever of unknown origin,' and hidden from history. The origin and evolution of tuberculosis, malaria, brucellosis, plague, and other zoonoses have been successfully researched by historians, identified by paleopathologists and clinicians in the past and in the modern era respectively, and diagnoses confirmed in samples both ancient and modern using DNA analysis. This paper discusses the history of Q fever in China and focuses on the intersections between Chinese historical texts such as the 16th century traditional medical treatise Ben Cao Gang Mu, promising avenues of archaeological and paleopathological research, and recent studies of human and animal health and disease to highlight historical gaps and remaining queries in the study of Q fever. Is this medico-historical cold case ready to be solved?

Paleo-Syndemics, Paleodemography, and Human Resilience in Northern China ***Qian Wang, Texas A&M University College of Dentistry***

Abundant Human burials have been found from the Neolithic Age to Bronze and Iron Ages and onwards in Northern China that are associated with important archaeological evidence of environmental settings and socioeconomic modes. Based on paleo-demographic and paleo-environmental conditions of Northern China of ninety-two Neolithic to Iron Age (10,000 BCE – 0) sites, there was a consistent population growth during climatic cooling and aridification at the end of the Holocene Climate Optimum and the 4.2k Rapid Climate Change event. This bioarchaeologically contextualized synthesis illuminated that Neolithic to Bronze Age populations demonstrated flexible behavioral adaptations by intensifying agricultural activities and habitat exploration throughout time and ecosystem change while undergoing an epidemiological shift. While examined under the framework of Paleo-syndemics, peoples of geographically and environmentally diverse Northern China were resilient through their biological and cultural adaptations despite global climate change and evidence for increased, zoonotic disease transmission. Under the

framework of Global History of Health-Asia Module, osteoarcheological and paleo-epidemiological studies in Asia are poised to investigate prehistoric population health through concepts of frailty and resilience and within the context of high-resolution archaeological data. It will not only enrich the firsthand health status and diseases patterns over generations in recent human history in an evolutionary sense, but also expand existing databases for global and local health agency authorities on policy making for contemporary populations with different economic-social status, ranging from pre-agriculture to modernization.

Session Organizer:

Jiangtao Harry Gu, Hobart and William Smith Colleges

Chair:

Jiangtao Harry Gu, Hobart and William Smith Colleges

067. Women's Knowledge and Agency in Early Modern Resource Management

Organized Session

4:00 to 5:30 pm - Friday 14 Nov.

Sheraton New Orleans: Floor 3rd Floor - Napoleon A2

This panel explores how women's engagement with resource management offers new avenues for understanding the gendered production, codification, and transmission of knowledge in the early modern period. Historians of science and technology have long recognized that published mining treatises and their male authors played a crucial role in the development of the early modern earth sciences. This panel instead explores women's practical knowledge that did not necessarily circulate in print but was nevertheless crucial to both the economies and communities of expertise in the management of mineral resources. Each paper considers a different scale of historical analysis: households in the Ore Mountains, working mines in Medici Tuscany, and commodity chains linking sites of mineral production and consumption across Atlantic and Indian Ocean worlds. They are based in the material context of early modern mining, a domain of resource management that has been the subject of burgeoning scholarly attention, especially because of the remarkably rich body of archives generated by the administration of mining activities. These include legal disputes, mining rights, payrolls, reports, correspondence and treaties, which have long been used by social and economic historians of mining, but which also offer rich insights into practical knowledge. Together, the three papers aim to generate discussion about the distinctive and integral roles played by early modern women in transforming natural materials into objects of human value.

Participants:

Female Economies of Collaboration and Care in the Ore Mountains *Tara Nummedal, Brown University*

This paper considers how a small group of seventeenth-century women managed their access to profit, labor, and debt in the Ore Mountains of Central Europe. We know about these women and their network today because of an investigation launched when they were "caught" in 1696 with a "suspicious and superstitious … creature" in their possession. The male magistrates in their small mining town determined that the "creature" was really an Alraun, a root with a long magical, alchemical, and medical tradition. The women themselves, however, called it a "little man" (Männlein), revealing a different understanding of its nature and abilities, as well as their relationship to it. I will draw on the women's testimony, as well as the material elements of the "little man" itself (still extant in the archive), to reconstruct the women's understanding of its origins and the type of care it required; its capacity to repay debts, locate treasure, ensure good fortune, and perhaps even amuse; and its circulation through domestic spaces and female networks. The economy of the "little man," I argue, reveals a distinctive economy of collaboration and care, differentiating it from more capitalist or extractivist models of wealth also circulating in the Ore Mountains.

Mining Households in Renaissance Italy *Gabriele Marcon, University of Vienna*

This paper explores the connections

between women's domestic labor and mining in early modern Italy. Some of the most important resource management tasks in early modern mining were performed above ground. From managing expenditures and smelting metals to prospecting for new deposits, burning charcoal, and performing household labor, these tasks reveal the hectic and dynamic rhythms of mining industries. While tasks involving direct engagement with natural resources and wage labor were typically carried out by men, unpaid activities like household duties were traditionally relegated to the domain of women. My analysis of women miners in the Medici mines of sixteenth-century Italy challenges this gendered division of resource management by offering new perspectives on how women's knowledge contributed to mining labor. The women of the Medici mines formed a socially diverse group who performed both paid and unpaid labor as day laborers, caregivers, and financial managers of credit institutions. Drawing on court-case testimonies, payrolls, and mining manuals from the mid-sixteenth century, this paper recovers women's mineral knowledge from domestic settings and activities – the household, the laundry, and financial budgeting – and integrates it into the broader context of labor and resource management in early modern mines. I argue that domestic tasks, and the embodied knowledge required to perform them, were not just forms of reproductive labor but revealed frameworks of resource management and metal production that centered on women.

A Global Approach to Women in Early Modern Mining ***Claire Conklin Sabel, University of Pennsylvania***

Across the early modern world, emerging state authorities and scientific institutions that exploited, conserved, and planned the management of natural resources, such as mining and forestry administrations, agricultural improvement societies, and large-scale irrigation projects were led by men. Many male participants in these enterprises contributed to a burgeoning discourse of "oeconomic" and useful knowledge that has been central to recent historiography of early modern science. This paper aims to illuminate the women missing from these histories and proposes that women's practical experience of resource management is a significant and under-researched body of knowledge, building on recent work on the intersections of labor and environmental history with the history of science. In addition to recovering exceptional women who did participate in early modern scholarly arenas, feminist scholarship has emphasized women's widespread roles behind the scenes of scientific work and illuminated embodied and experimental knowledge developed within the household. But much early modern resource management connected domestic settings with diverse workscapes, across cities, rural landscapes, and colonial spaces. This paper shows that women's expertise and labor were integral to mining projects that linked domestic, commercial, industrial, and courtly sites in the Americas, Europe, and Asia in the sixteenth and seventeenth centuries. I argue that women cultivated and deployed mineral knowledge in varied and active roles, using distinctive and practical expertise. Focusing on resource management reveals women's contributions to the broader ecosystem of knowledge production about early modern minerals and the earth they were mined from.

Session Organizers:
Gabriele Marcon, University of Vienna
Claire Conklin Sabel, University of Pennsylvania

Chair:
Lydia Barnett, Northwestern University

068. Family Matters: The Stuff of Heredity in Greco-Roman Antiquity

Organized Session
4:00 to 5:30 pm - Friday 14 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon A3

Family Matters: The Stuff of Heredity in

Greco-Roman Antiquity Matters of bloodline loomed large in the ancient Mediterranean: Fictive kinship played central roles in ethnic identity, narrative history, and interstate politics (Hall 1997; Patterson 2010; Humphreys 2019). Hereditary blood guilt likewise structured the drama of the tragic stage and of the political arenas of Athens and Rome (Gagné 2013). Ancient scientists, from the early physiologos Democritos to Aristotle and the physician Galen attempted to explain the inheritability of biological phenomena like congenital disease and eye color (Lehoux 2014). A raft of recent scholarship, then, has recognized the power of these transgenerational narratives in constructing meaningful visions of the past, power, and responsibility in the present. Moreover, these hereditary discourses never existed in isolation but, rather, were "impressionable," shaped by the environmental concerns of their social and cultural moments. That is to say, the ancients, as modern scholarship on the matter of family, saw not only a wide array of hereditary traits, but multiple and changing explanations of heredity itself. At the same time, perhaps in part because ancient Greeks and Romans themselves did not possess our own, unified conceptions about genetics, these distinct and diffuse notions of the inheritable—spanning biology and politics, religion and ethics—have not been brought together as a unified field of historical inquiry. This panel thus identifies a major lacuna in this scholarship, by observing both the changing and changeable of explanations of heredity in antiquity, as well as concentrating on the matters of heredity itself, from biological and moral likeness, civic privileges and prerogatives to theological power and responsibility. The three proposed papers—together with responses given by Mackenzie Cooley—throw light on the variety of ways heredity was conceptualized and intersected with other domains of thought and practice in antiquity.

Participants:

States of Heredity: The Science of Similarity in the World of the Polis ***Calloway Scott, University of Cincinnati***

This paper introduces and frames the problems of doing the social history of heredity in Greco-Roman antiquity, long before the age of the genome. It does so by looking to the biological treatises of the Pre-Socratic physiologoi and the Hippocratic Corpus as they attempted to explain trait inheritances such as congenital disease (nosos suggenes) as it related to the broader phenomenon of likeness (eikos) between parents, children, and more remote ancestors (enumerated in Lesky 1951). These problems were important because they marked in a special way the boundaries of what could be known about the body and its processes through the application of the particular epistemological toolkit promoted by natural scientists (viz. the systematic observation of the causes of apparent phenomena supplemented by analogical reasoning to explain the causes of non-apparent ones.) Consequently, across these biological texts we find that competing accounts of generation and inheritance formed a central feature in making and defending claims of scientific authority. At the same time, these competing theories shared the wider project of reasonably explaining away unlikeness between parents and children in order to relax anxieties concerning paternity (e.g., Lehoux 2014). On the one hand, debates about inheritance contributed "locally" to the coalescence of biology as a "discursive community," a community organized as much by the topics of its arguments as by the methods and social habits supporting them (van der Eijk 1995). On the other, these explanations of heredity reinforced "global" ideological factors which enmeshed biological considerations of paternity with differently freighted practices of inheritance, like the eligibility for marked social positions like priesthoods, citizenship, or religious guilt. Thus, we simultaneously see the development of a specific conceptual vocabulary of heredity within the life sciences as well as its functional imbrication within the wider ideological landscape of ancient political life. Ultimately, then, I aim to show that the "epistemic space" of hereditary knowledge

was conceived not in isolation, nor even as a post hoc justification for the "way things are," but as a constitutive feature of the polis and its defining socio-political institutions.

Heredity Between In-Formation and Materialism ***Yanneck Wiegers, Johns Hopkins University***

From the earliest fragments of Greek philosophy, we find a vibrant discourse on heredity, a topic that has generated substantial scholarship over the past seventy years (from Lesky 1951 to Lehoux 2014). Earlier scholarship has sometimes emphasized the dominance of preformationist views among early thinkers and the supposed absence of any concept resembling modern "information" (Grmek 1991). Early Greek models were frequently described either as strictly materialist—emphasizing like-to-like transmission of physical traits through particles—or as immaterialist accounts of form divorced from substance. A significant shift came with Kullmann (1998), who began to question this binary and traced more complex models in Greek thought. This paper builds on and extends such critiques by showing that ancient thinkers grappled intensely with the tension between materialist accounts of reproduction and what we might now call informational structures. It will show in Plato's Timaeus a surprising account of generation that neither reduces heredity to direct material transfer nor relies on immaterial forms. Instead, the dialogue articulates a conception of information that is fundamentally material—structured into and through physical processes. By analyzing this materialist theory of information in the Timaeus, the paper challenges the opposition between form and matter that still underlies many modern frameworks. It also invites reflection on the persistence of immaterialist fantasies in our own "digital" age, where information is often imagined to float free of any substrate. Antiquity, far from lacking the tools to think heredity, may offer more grounded models than we have yet acknowledged.

Galen's Germ Line ***Malina Buturovic***

This paper draws out Galen's unusual place as a theorist of heredity, first within his own intellectual culture and then within the long history of heredity. Among his contemporaries and predecessors, I argue, Galen stands at an unusual juncture. On the one hand, he inherits a predominantly medical model for thinking about hereditary and congenital influence. Within this model, heredity is equivalent to all other cases of material influence that shape a person's character over the course of their lives, such as drunkenness, bad food, or illness. Heredity is liable to medical manipulation and accessible to medical intervention. But Galen also inherits a perspective on heredity closely associated with Aristotelian teleology, according to which heredity stands apart from all other material and environmental influence, as the process ensuring functional adaptation, species immortality, and good order in the natural world. Heir to both 'medical' and 'biological' ideas of heredity, therefore, he produces an account reflecting this dual inheritance: a version of Aristotle's theory of heredity that nevertheless accords vastly more importance to connate matter (the matter composing both parents' seeds) than either the doctors' or the teleologists'. This unusual positioning within his own intellectual tradition, at the juncture between two traditions, makes Galen, in turn, an anachronistic figure in the longer history of heredity—one who challenges the periodization of pre-modern and modern thinking about heredity, as well as the accompanying division between "hard" and "soft theories of heredity. "Connate matter," understood as the bearer of a "germ line," is often considered a distinctively modern innovation—linked with the development of "hard" theories of heredity like genetics. Using the anachronistic example of Galen, I argue that its conceptual importance was also visible to earlier thinkers, who—much like later geneticists—read across these two strands, grappling directly with the gap

between medical and biological perspectives on heredity..

Session Organizer:
Calloway Scott, University of Cincinnati

Chair:
Calloway Scott, University of Cincinnati

Commentator:
Mackenzie Anne Cooley, Hamilton College

069. Proxies: Producing Knowledge through Indirect Indicators

Organized Session
4:00 to 5:30 pm - Friday 14 Nov.
Sheraton New Orleans: Napoleon B1

Much of the world cannot be measured or observed directly. Instead, we use "proxies" to understand the world "out there." Proxies can include epistemic stand-ins, measurement tools, models, and surrogates for (among other domains) genetic, chemical, or engineering problems. This panel explores the history of knowledge production by proxy, focusing on the ways these stand-ins shape, distort, and stabilize scientific understanding and the knock-on effects of their assumptions about the world. These objects and practices function within a broader ecology of delegation, where humans and nonhumans alike are called upon to represent, embody, or stand in for what is too distant, dangerous, or unruly to observe directly.

Participants:

Climate by Proxy: The Politics of Indirect Measurements ***Melissa Charenko, University of Pennsylvania***

During the twentieth century, scientists developed several techniques to infer past climates from what came to be known as climate proxies. Proxies such as pollen, tree rings, and ice cores indirectly capture former climates, forcing scientists to consider many confounding factors as they seek to distinguish the climate signal from the surrounding noise. This paper examines the reception of climate proxies in the early twentieth century. It explores how scientists viewed proxy techniques and the conclusions they supported. I argue that, while there were legitimate concerns about proxies, some scientists dismissed proxies for reasons that had little to do with their interpretation. Instead, denouncers used the indirect nature of inferences involving proxies to advance arguments for immigration restriction, which they had linked to a stable climate. Since proxies pointed to a dynamic climate, critics seized on the uncertainties of measuring climate by proxy to maintain their positions on racial differences. This kind of politically motivated dismissal persists to this day and has become the standard playbook for rejecting interpretations about climate that critics view unfavorably.

Superior Students: Defining and Measuring "Gifted Pupils" in the Cold War, 1958-1969 ***William Krause, Vanderbilt University***

In the years following Brown v. Board of Education (1954) and the Sputnik Crisis (1957), a new kind of student became the subject of public debate among policymakers, educators, and parents alike: the "gifted" pupil. These types of students were believed to be everywhere, yet their existence was elusive, their special faculties impossible to pin down, and their creative capacities resistant to formal measurement. "Superior Students" tracks the messy attempt to define, measure, and categorize these students against the backdrop of school desegregation as well as efforts to develop US science education. It contributes to the insights of historians Jim Wynter Porter and Samuel Franklin, who have narrated important dimensions of the history of giftedness in public schools during the Cold War. Using both public-facing articles as well as archival documents from several efforts to develop gifted education in public schools, "Superior Students" excavates the politically fraught history of attempts to identify and cultivate the "intellect" in public school students. "Superior Students" complicates the history of intelligence metrics, revealing the disagreement among members of this discourse – which included policymakers, educators, administrators, parents, scientists, and students themselves. While at times "giftedness" enforced the power of standardized testing, often the category

thwarted such measurements, and many used the concept of the “gifted pupil” to refer to the seemingly unknowable dimensions of intellect that could not be viewed or aggregated. Ultimately, the paper exposes how “giftedness” as a proxy for tangible intellectual value flowed from experts into public education, transforming both cultural sensibilities and educational infrastructures.

Standing In and Standing By: The Labor of Proxy Knowledge Production ***Dylan Mulvin, London School of Economics and Political Science***

Matters of performance and embodiment are central to the history of proxification. But what are the political consequences of the collision of standardization and embodiment in seemingly rigid knowledge systems? How do materialized proxies mediate knowledge through the structures of encoded normativity—rendering certain bodies or behaviors as “typical” while marginalizing others? This paper answers these questions by tracing several standardization processes through relations of trust and labor that chart the limits of representability. Drawing on my recent book, Proxies: The Cultural Work of Standing In, I examine, among other things, the explicit instructions for handwashing prototype kilograms in the metric system, the technical lineages of test images using human models, and the roleplaying scripts of standardized patients in medical accreditation. I focus on four forms of labor in relation to proxies: choosing proxies, interfacing with proxies, repairing/maintaining proxies, and being proxies. By looking to these sites and practices of labor, the ways people create, animate, and maintain usable analogies for the world, we can locate the material, aesthetic, embodied, and choreographed practices ground standards in shared representations. Rather than dismissing proxies as mere distortions, I call for a reorientation: to treat proxies as historical artifacts with their own biographies, controversies, and epistemic burdens – to take seriously the labor of acting “as if” without dismissing it as an unfortunate byproduct of delegation. By tracing and comparing the lives of proxies across domains we can complicate narratives of epistemic certainty and show how knowing has always depended on what (and who) we allow to stand in.

Ice Cores and Subglacial Microbiological Life: Reconstructing the Past and Predicting the Future ***Travis Carioscia, Montana State University***

Since the 1959 Antarctic Treaty, Antarctica has become a laboratory continent by and for science. Recent advances in ice-coring technologies have led to an expanded understanding of Earth’s paleoclimate history and to the discovery of subglacial microbiological ecosystems beneath the ice. By analyzing atmospheric gases trapped within Antarctic ice, scientists have begun to reconstruct Earth’s climatological past using ice cores as proxies. Meanwhile, microbiological organisms discovered at the base of the sheet are being studied to help predict what biological life will look like on exoplanets such as IO and Encephalus. Calls for research funding often include passages about how research conducted in Antarctica not only helps contextualize the past, but could also be applied to space exploration in the future. In this way Antarctic science is using the Antarctic environment as a proxy to reach back into the past and look forward into the future. This paper will focus on Antarctic ice cores extracted since the 1970s, including the recent Dome C ice core that contains between 900,000 and 1.2 million years of continuous climate history, and the Lake Vostok ice core, the first to show definitive proof of organic microbiological life hidden beneath the ice. These cores are represented in the media as essential to understanding climate change, and may solve ancient climate mysteries. This work will be based on a research trip to the National Ice Core Facility in Spring 2025. I argue that the social, cultural and political values placed on the Antarctic environment are reflected in the way that ice cores and

subglacial microbes are chosen to represent climate science endeavors to a global audience.

Session Organizer:

Melissa Charenko, University of Pennsylvania

Chair:

Melissa Charenko, University of Pennsylvania

070. Psychology, Race, and Empire in the Americas

Organized Session

4:00 to 5:30 pm - Friday 14 Nov.

Sheraton New Orleans: Floor 3rd Floor - Napoleon B2

How did ideas about the mind inform how imperial and colonial regimes sought to selectively incorporate and manage racialized and sexualized difference? This panel brings together scholarship that approaches histories of psychology as histories of race, colonialism, and empire. The papers gathered here illuminate how sciences of the mind both required populations under racial, colonial, and militarized control and generated new taxonomies of difference understood to be central to such regimes. Spanning geographies of Mexico, the Philippines, South Vietnam, and the U.S., this panel offers ways of gleaning the complex formations of American empire as it has historically attempted to capture, define, and pathologize particular psychologies and ways of thinking and being. Timmy Vilgiate shows how understanding Indigenous personalities and ways of thinking were part of Indigenista development paradigms that sought to implant “scientific” ways of understanding the natural world over the “superstitions” of curanderos. Linda Luu looks at how studies of Vietnamese psyche, culture, and personality were part of both U.S. militarized counterinsurgency campaigns during the war and refugee resettlement efforts in the U.S. following the war. Joshua Acosta examines how contested medical and legal notions of mental insanity shaped Filipino political subjectivity and the broader contours of colonial medicine in the Philippines. Andrea Ens examines how 1940s American doctors justified subjecting impoverished Black men to harmful conversion therapies aiming to eliminate their same-gender sexual desires in state hospital settings.

Participants:

Indigenismo, “Psychic Resistance”, and Superstition: Psychotropy and Psychology in the Interamerican Indigenista Movement, 1940-1960 ***Timothy James Vilgiate, University of Texas at Austin***

At the 1940 Congreso Interamericano Indigenista, social scientists and policy makers from the United States, Mexico, Guatemala, Brazil, and other American countries discussed strategies for the “incorporation” of Indigenous populations into their respective nation-states. Even as participants in the transnational Indigenista movement broadly rejected biological determinism, they at the same time grew increasingly preoccupied with rendering “Indigenous minds” legible and governable. The proceedings of the 1940 Patzcuaro conference called, among other things, for studies of the potential for “psychic resistance” in communities subject to relocation. In the 1950s, preparing for such a relocation in advance of a hydroelectric project in the Papaloapan river basin, the Mexican Instituto Nacional Indigenista found curanderos—recognized in communities as interlocutors between human and more-than-human forces—to be central agents in fomenting the kind of “psychic resistance” that concerned the attendees at the Pátzcuaro congress. In resettled communities, Indigenistas hoped to gradually implant a new, “modern” way of being, with “scientific” ways of understanding the natural world prevailing over the “superstitions” of curanderos. I argue that the importance given within Indigenista development paradigms to understanding Indigenous personalities and ways of thinking helped establish Indigenous “psychedelic” flora and the knowledge of “curanderos” as potentially valuable research topics. Understanding the effects of such plants promised to unlock knowledge not only about Indigenous cultures, but about the human mind more generally, as substances derived from Indigenous sacred flora like psilocybin and lysergic acid amide (LSA) provided pharmacologists with

corroborating evidence for the role of serotonin in neurotransmission.

From Cold War to Cross-Cultural Psychology in the American War in Vietnam, 1968-1983 ***Linda Luu, New York University***

In 1968, two American researchers and a team of sixteen Vietnamese students with university training in sociology descended upon the Mekong Delta armed with census cards and surveys. Nearly four decades before the controversial Human Terrain System employed social scientific expertise to research "the human terrain" during the U.S. wars in Iraq and Afghanistan, social psychological research in Vietnam, conducted by groups like Human Sciences Research, RAND, and Simulmatics, attempted to understand the South Vietnamese psyche and culture for the purposes of counterinsurgency. This paper explores the traffic in ideas between Cold War psychological research conducted during the war and ideas regarding Southeast Asian mental health as they were mobilized in refugee resettlement efforts following the war. Drawing on scientific literature and handbooks as well as interviews with practitioners, I examine how managing Southeast Asian affect, culture, and psychology was imagined by military and government officials and by psychologists and social workers to be crucial to U.S. counterinsurgent warfare and later the turn to a carceral warfare-workfare economy.

Madness between Religion and Criminality: Mental Illness and Colonial Order in the Philippines under American Rule, 1912-1931 ***Joshua Acosta, University of California, Berkeley***

In February of 1912, the American colonial government in the Philippines enacted Act No. 2122 which codified "insanity" by establishing protocols to legally define and confine persons deemed to exhibit a "defect of the brain." Despite attempts to establish an objective and uniform protocol, this paper examines how the arrest of two local religious and political figures—Lorenzo Joaquin and Flor Intrencherado—garnered debate and popular resistance to colonial public health authority. Drawing from legal journals, medical texts, and newspaper accounts, I examine how contested notions of mental insanity illustrate how medical knowledge was not unilaterally defined but interdependently shaped between American and Filipino actors. Moreover, this project aims to historicize how psychopathology and popular perceptions of mental illness shaped Filipino political subjectivity and the broader contours of colonial medicine in the Philippines. Madness and the multivalent discourses surrounding it offer a window to glean into the complex formations of medical politics, imperial anxieties, and anti-colonial sovereignty across U.S. imperial terrain.

"Definitely Hereditarily Tainted": Race, Class, and Conversion Therapy Practice in 1940s American State Hospitals ***Andrea Ens, Purdue University***

In 1944, Norwich State Hospital psychiatrist Samuel Liebman published an article in the Journal of Nervous and Mental Disease concerning his efforts to treat a twenty-three-year-old Black man repeatedly institutionalized and released between 1942 and 1943. Liebman wrote that the young man suffered from psychotic delusions, "transvestism," and same-gender sexual desires, each supposedly caused by his upbringing and hereditary background. Norwich staff thus performed more than twenty rounds of electroconvulsive therapy (ECT) on this individual while he was in their care. This presentation uses Liebman's paper as a case study to examine how 1940s American doctors justified subjecting impoverished Black men to harmful conversion therapies aiming to eliminate their same-gender sexual desires in state hospital settings. Liebman used a blend of psychoanalytic theories, Myerian methods, and negative eugenics philosophies about socially marginalized groups to suggest that Blackness and poverty forged hereditary predispositions towards queer

behavior, desires, and identities. These philosophies, combined with Norwich's institutional management priorities and the longstanding colonial assumption that queer people of color were existential threats to white sexual and moral health, rationalized Liebman's aggressive psychiatric approach towards this patient. This case thereby demonstrates the complex social, cultural, and medical factors that informed institutional conversion therapy program design and implementation in 1940s America.

Session Organizer:
Linda Luu, New York University

Chair:
Linda Luu, New York University

071. Contesting Life and Liberty in New Landscapes: A Reconceptualization of Public Health during the First Great Migration in the United States

Organized Session
4:00 to 5:30 pm - Friday 14 Nov.
Sheraton New Orleans: Napoleon B3

Historians of the United States, Black America, labor and migration, economics and capital, political activism, urban development, and beyond have contributed robust scholarship to the historiography of the great migration of Black southerners to U.S. cities further north, east, and west that began in the early twentieth century. Critically, however, the Great Migration also stands as a unique history of public health, in which the mass movement of Black people from the Jim Crow south radically transformed Black individuals' access to health care and community health services—most often by offering new agency for Black individuals to care for themselves. Building on Darlene Clark Hine's work on the impact of health care professionals on civil rights activism for racial equity and Vanessa Northington Gamble's study of the Black hospital movement in Chicago, this session will illuminate the First Great Migration's impact beyond the foci of those seminal works—physicians, nurses, and hospitals—and uncover new public health institutions, entities, and risks born out of this transitionary period in United States history.

Participants:

Asthma and the Politics of Risk in Black Migration to the Urban North *Ijeoma B Kola, University of Notre Dame*

During the first wave of the Great Migration, asthma emerged not only as a respiratory condition but as a marker of the racialized risks embedded in Black urban life. This paper examines how different Black actors—including physicians, civic leaders, and the Black press—interpreted, debated, and sought to mitigate the health risks associated with migration to the urban North. Drawing on advice columns, public health reports, newspaper commentary, and Black intellectual scholarship, it traces how asthma was invoked in the early twentieth century to explain the dangers of northern environments: exposure to mold, dust, and rodents in crowded tenements, unregulated patent medicines laced with narcotics, and even the belief that Black people were biologically unsuited to cold weather. Rather than centering a single institutional voice, this paper foregrounds health risk itself as a terrain of negotiation and contestation. Physicians mobilized their authority to educate readers, civic leaders debated whether northern life threatened Black vitality, and journalists used respiratory health as a measure of the migration's costs. Managing asthma became not just a medical task, but a symbolic and material struggle over Black economic mobility and bodily survival. In narrating asthma risk, these actors reshaped the meanings of health, labor, and opportunity in the burgeoning Black metropolis.

Black Women Write In: Health Advice and the Black Press during the Great Migration *Wangui M. Muigai, Brandeis University*

This paper analyzes the Black press as a key public health institution in the early twentieth century decades of Black migration. Despite robust scholarship that has examined the influence of Black newspapers in politics, labor, and religious life, their role in shaping health knowledge

and beliefs has received comparatively less attention. Drawing on hundreds of questions and letters published in early twentieth-century newspapers, I foreground the ways Black women in particular leveraged newspapers as a space for broaching intimate, and sometimes stigmatizing, health concerns and navigating a shifting landscape of care options. Many sought information on how to get pregnant, determine if they were expecting ("Am I pregnant again?"), protect their pregnancy, and prevent future ones. Others voiced fears of going "under the knife" to treat their reproductive conditions, haunting records of how Black women recognized their vulnerability during the eugenics era. As this paper will demonstrate, Black women engaged newspapers in significant and intricate ways: as a resource for health information, a platform for advocating for their needs, and a forum for negotiating rising medical authority. In doing so, they pressed on the boundaries between lay knowledge and professional expertise, consuming and co-creating health discourses in public spaces.

The Pharmacy in the Segregated City
Osaremen F Okolo, Harvard University
This paper will follow a Black patient walking into a drug store in Chicago, Illinois, Columbus, Ohio, and Old Saybrook, Connecticut through the interwar period to the end of the Second World War, historicizing the sociocultural and sociopolitical impact of Black-owned independent pharmacies. The setting and time period allows me to consider the social fabric surrounding this pharmacy: the first Great Migration of Black southerners to northern and midwestern cities and suburbs, fleeing vicious racial segregation, and the response of the previously predominantly white communities they arrived in; Black individuals, just two generations removed from enslavement, seeking to build wealth and community stability through small businesses like the drug store; how the training and practice of Black pharmacists was shaped by racial segregation; and whether the position of pharmacist bestowed privileges upon Black people that they would have otherwise been cut off from in the segregated United States. Expanding on Nancy Tomes' history of how the white patient was remade through the brick-and-mortar pharmacy in the interwar period, I utilize W.E.B. DuBois' groundbreaking data collection on the existence of Black druggists at the turn of the twentieth century and my own extensive archival research on three Black-owned drug stores in these locations of interest to "make" the Black drug store patient. As I put forth the new notion of a public health pharmacy, I argue that the independent drug store became a site of public health and a bedrock of Black communities across the United States in the early twentieth century—setting the stage for the drug store to become a key setting of planning, protest, and victory during the Civil Rights Movement.

Session Organizer:
Osaremen F Okolo, Harvard University
Chair:
Evelynn Hammonds, Harvard University
Commentator:
Evelynn Hammonds, Harvard University

072. Spaces of Inquiry: Making Science and Technology in the Modern World
Roundtable
4:00 to 5:30 pm - Friday 14 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon C
Our panel offers a multi-dimensional study of "spaces of inquiry," how communities for the pursuit, teaching, or sharing of knowledge have evolved and expanded across decades. This analysis builds on scholarship by Robert Kargon and Stuart Leslie, who have constructed powerful models of different knowledge-production sites, featuring empirical detail and conceptual creativity. Kargon's Science in Victorian Manchester (1977), and Leslie's Boss Kettering (1983) and further publications on labs at GM, IBM, and AT&T, offered detailed case-studies of campus and corporate laboratories. Their approach dialogues with works by Latour and

Woolgar, Shapin and Schaffer, Gooday, Kohler, Westwick, Traweek; Bijker, Hughes, and Pinch, and others. Kargon and Leslie's 1996 collaborative article "Selling Silicon Valley" mapped the postwar geographical, technological, and economic forces that allowed Frederick Terman to transform sleepy Santa Clara into an economic and cultural juggernaut. Kargon and Leslie subsequently historicized a a vast conceptual broadening of technoscientific spaces, with initiatives in New York, MIT, and India to jump-start high-tech research along Silicon-Valley's model. Kargon and Leslie's decades-long research connects studies of history of science, technology, and STS to confront a signal question of modernity: how can a space "become scientific", and what gives it intellectual, material, and symbolic cultural authority? Centering this question, our roundtable unites Kargon and Leslie with several generations of their students and close colleagues, to extend histories of universities, laboratories, and corporations into more wide-ranging "spaces of inquiry." Together, these case-studies, stretching across three centuries, connect stories of scientific and engineering spaces to broader themes, including histories of architecture and invention, science education and popularization; industry, power, and geopolitics.

Session Organizers:

Amy S Bix, Iowa State University
Bruce Hunt, University of Texas
Scott Knowles, Korea Advanced Institute of Science and Technology

Chairs:

Penelope Hardy, University of Wisconsin–La Crosse
Miriam Levin, Case Western Reserve University

Participants:

Robert Kargon, Johns Hopkins University
Stuart Leslie, Johns Hopkins University
Emily Margolis, National Air and Space Museum, Smithsonian Institution
Eric Nystrom, University of Nevada-Reno
Arthur Molella, National Museum of American History, Smithsonian Institution
Thomas Cornell, Rochester Institute of Technology

073. Beyond-Human Sciences of Sea and Space

Contributed Paper Session
4:00 to 5:30 pm - Friday 14 Nov.
Sheraton New Orleans: Floor 4th Floor - Nottoway

Participants:

Menfish, Mermaids & Aquanauts: More-than-Human Hybridities in Scientific Diving, 1938-1968 ***Elexis Trinity Williams, Cornell University***

When saturation diving and underwater habitats splashed onto the scene midcentury, Cold War oceanographers began imagining new techno-evolutionary possibilities for human bodies underwater. The man of the future would be blue and hybrid, a cyborg "manfish" drawing upon adaptations borrowed from marine species and facilitated by technologies surpassing the limitations of the human body in the "extreme environment" of earth's inner space. Their goal? An old familiar one: colonize the seafloor, exploit marine resources. But by the end of the twentieth century, such efforts had given way to the increasing abstractions of satellites and remote sensing, sonar, AUVs, and marine robotics, as scientists and naval experts began to reimagine oceans as a medium for sound transmission rather than a place for habitation. However, recent developments have begun to tell a different tale. Part of a larger project contesting the narrative that the ocean intimacies of midcentury scientific diving have succumbed to the hegemony of disembodied and remote marine epistemologies, this research examines how sensory and embodied ocean encounters continue to influence marine sciences, contributing to the destabilization of the category of the human and shaping historical and contemporary Blue Anthropocene futures. In this chapter, I trace the emergence of the saturation diver, applying a historical analysis of the memoirs, government reports, chronicles, and first-hand accounts they produced to understand how these

diver-explorer-scientists, and the novel underwater habitats which facilitated their early saturation diving experiments, produced visions of a subsea human future, orienting attention toward the coevolutionary possibilities of human-marine relations.

Women of the Sea, Modernity, and Postwar Transpacific Environmental Physiology ***Alice Hong, Princeton University***

This paper charts the trajectory of Korean, Japanese, and American environmental physiologists' scientific investigations on the respiratory and cold adaptabilities of Korea's haenyeo and Japan's ama. Haenyeo and ama are female divers who rely on only the air in their lungs to dive and harvest shellfish and seaweed by hand from the ocean floor. This paper explores how knowledge-making about sea women's bodies contributed to the formation of a transpacific environmental physiology network in the postwar period. After coming across 1930s Japanese studies on the diving women, American and American-trained physiologists like Hermann Rahn (1912-1990), Donald W. Rennie (1925-1992), and Suk Ki Hong (1928-1999) became fascinated with the physiological capabilities of these women in the 1960s and 1970s. Research centered on the sea women necessitated a close, albeit unequal, collaboration between Korean, Japanese, and American scientists and working relationship between the scientists and the sea women. The scientists saw the sea women's way of life as being outside the bounds of modernity, such as other perceived "primitive" peoples like the Inuit people of Alaska. Like physiological studies on Inuit people, sea women's physiological data was seen as potentially answering questions about the possibilities of human adaptation in a post-apocalyptic world.

At the Foot of Mount Ararat, on Which Noah's Ark is Said to be Beached: Cold War Convergence and Extraterrestrial Intelligence ***Gabriela Radulescu, Independent Scholar***

In 1971, the US and USSR Academies of Sciences organized a scientific event that examined the topic of "Communication with Extraterrestrial Intelligence" (CETI). CETI emerged under various names as an interdisciplinary field, with radio astronomy at its core, as part of the Space Age. This presentation analyzes the 1971 conference along three lines. First, it considers the location—the Byurakan Astrophysical Observatory, situated at the Foot of Mount Ararat, on which Noah's Ark is said to be beached, in the Soviet Republic of Armenia. Second, it examines the series of events related to CETI in the Soviet Union, the US, and internationally, leading to the conference as a cumulative result. Third, it explores the concept of Cold War convergence - the idea that the socialist and capitalist societies were gradually becoming more similar and would "converge" into one society. By looking at a variety of primary sources, from published materials across the USSR, the US, as well as in other countries, materials conceived equally within a "national" context, and in an "international" one, this presentation gives an in-depth, contextualized picture of the 1971 CETI gathering. Through a systematic exploration of the imaginary of CETI—the conceptual frameworks scientists, intellectuals, and other participants used to shape this emerging field—the presentation highlights the interplay between ideas and conditions that gave rise to them. This includes shifts in Soviet-US scientific and diplomatic relations, outer space regulations, nuclear disarmament efforts, scientific cultures, and institutional, social, and philosophical aspects of scientific organizations.

074. (Re)Collecting Life and Death at the University

Organized Session

4:00 to 5:30 pm - Friday 14 Nov.

Sheraton New Orleans: Floor 4th Floor - Oak Alley

In "(Re)Collecting Life and Death at the University," we interrogate the university as a site

where imperial, eugenic, and extractive logics have historically underwritten the production of scientific knowledge. Drawing from our shared position within Yale—an institution deeply entangled in these histories—we foreground the university not only as a producer of knowledge, but as a container of life and death whose collecting practices have long defined the boundaries of the human, the natural, and the knowable. Traversing an array of topics from across scientific domains—including bryology, embryology, entomology, medical informatics, population science, and psychosurgery— our panel traces how Yale has collected, categorized, and disciplined life. The act of collecting, whether of patients, populations, materials, specimens, or data, requires discernment as to what belongs inside and outside the boundaries of the collection. Recollecting, then, becomes a political act, one that unsettles institutional memory, reclaims suppressed histories, and reimagines institutional knowledge-making. By centering (re)collection as both an analytic and a political act, this panel asks: What does it mean to remember differently within the very institutions that have historically enforced forgetting? How have scientific collections naturalized regimes of race, development, and life itself? How do we reckon with our entanglement in the structures we seek to critique?

Participants:

Bryology, Yale's Eugenics Movement, and U.S. Imperialism in the Caribbean ***Ana Cristina Betancourt, Yale University***

This paper narrates how Yale's collections hold life. What does it mean to collect for natural history? Naturalists have been concerned or preoccupied with how to organize and standardize the non-human natural world. And while 19th century naturalists are more commonly known for engaging with ideas about evolution and distribution, they were also engaging in discourses around race and eugenics. Thus, this paper traces how systematic natural history knowledge might have been a tool foregrounded by eugenicists in their engagement with scientific racism. Naturalists collected, or sent collectors, around the world in order to expand knowledge about their discipline and also develop theories about species distribution and genesis. Yale holds vast botanical collections, such as the bryophytes collected by Amos Arthur Heller, Alexander W. Evans, and Paul Sintenis which feature prominently within Yale's herbarium. This paper will focus on Yale's acquisition of naturalists' collections from the Caribbean. These collectors and botanists collected mosses throughout the Caribbean, however I am specifically interested in their collections from Puerto Rico, particularly in relation to Puerto Rico's colonial history. What can Puerto Rico's colonial status inform us about how collections were happening and whose perspectives were being foregrounded? How did Yale come to have these collections? Were the collectors part of Yale's faculty or were they part of the larger network of naturalists? How have Yale's stewardship of these collections informed the development of eugenic theories? The paper will work to analyze the relationship between colonialism, scientific racism and bryological collections.

Maternal Death in the Age of Embryo Collection: Dr. Elizabeth Maplesden Ramsey and the "Yale Embryo" ***Sara Hollar, Yale University***

In 1932, Yale-trained medical intern Elizabeth M. Ramsey found a fourteen-day-old embryo in a young woman's uterus while performing a routine autopsy in the Laboratory of Pathology at the Yale School of Medicine. The twenty-three-year-old patient's only recorded medical history demonstrated that she was unmarried and had "ingested an arsenic-containing insecticide 12 hours before her death." Then considered to be the youngest embryo ever collected, Ramsey named this specimen the "Yale Embryo" and subsequently donated it to the Carnegie Institution of Washington Department of Embryology (CIWDE), the largest American embryological research center. In the golden age of embryo collecting, Ramsey's discovery was a scientific boon and began her journey to

considerable career success over the next decades. Following her donation, Ramsey was offered a research appointment at the CIWDE, where she stayed for the remainder of her career, serving as a pathologist and the curator of the Carnegie embryo collection. This paper uses Ramsey's career to understand how embryos collected from autopsies were vital to advancements in embryological research. Although miscarriages, abortions, and hysterectomies produced the majority of the embryos in the CIWDE collection, embryos retrieved during autopsies constituted some of the first early-pregnancy embryos catalogued. Further, death from ingestion of toxic chemicals, potentially for abortive purposes, signaled an opportunity for doctors to "discover" these rare and highly prized embryos. Touted as the "miracle of life" by Ramsey and her contemporaries, early-term embryo collection was in fact founded on pregnancy loss and at times, the deaths of the women who had carried those embryos. I argue that lack of reproductive healthcare, and the resultant potential of maternal death, played a significant yet under-recognized role in Ramsey's career, the history of the CIWDE, and American embryological research.

On the Wings of a Peruvian Butterfly: Entomology, Empire, and Eugenics at Yale ***Hayley Maritza Serpa, Yale University***

This paper presents a feminist and decolonial history of entomology at Yale University by following the life journey of a Peruvian butterfly. It argues that insects, especially the feminized tropical butterfly, have long been used as racialized and gendered props in population biology. The knowledge produced from studying these insects—the theories, models, and methods—has subsequently been used to violate the bodily autonomy, agency, and the right to self-determination of women of color. At its most explicit instance, the logic of biological control developed in entomological practice through the dissection of the reproductive systems of racialized and gendered butterflies, as well as ecological studies of these insects in population biology, contributed to the rise of eugenic forced sterilization and population control campaigns throughout the late twentieth century. By primarily focusing on Charles Lee Remington (1922–2007), Yale's first curator of entomology, co-founder of Zero Population Growth, and lifelong Christian Scientist, I analyze how insect taxonomy and the scientific study of butterfly reproduction has been deeply intertwined with imperialism, population control, and eugenics. Remington's career as a public advocate of population control and immigration restriction exemplifies how entomology became a vehicle for demographic regulation, positioning insects as both scientific subjects and metaphors for controlling human populations. This paper argues that the classification of insects was foundational to the development of population science, particularly in the racialized and gendered management of reproductive health. Through archival research, oral histories, and multispecies ethnography in Peru and the United States, I examine how Peruvian butterflies have been extracted, racialized, gendered, and deployed as evidence in projects of global environmental and reproductive control. Ultimately, this paper asks for a reconceptualization of entomology as a contested site where race, gender, and population boundaries were not only drawn but actively remade.

Racialized Social Control: Psychosurgery in the Age of the Civil Rights Movement ***Ashley Marie Cooper, Yale University***

In 1973, Lawrence Z. Freedman, a Forensic Psychologist at Yale, presented on a "New Understanding of Brain Function" at the American Orthopsychiatry Association. The "new understanding" which Freedman attested to at the conference was grounded in psychosurgery—a neurosurgical technique used on patients with severe and persistent mental illness. Although certain forms of psychosurgery, such as the

lobotomy, had declined by the 1970s, others, such as bilateral cingulotomy—used to treat depression and obsessive-compulsive disorder—continued to proliferate throughout the late twentieth century. The same year as Freedman's conference presentation, Ebony Magazine, a historically Black periodical, warned readers of a "new threat" to the Black community: psychosurgery. In his article, entitled "New Threat to Blacks: Brain Surgery to Control Behavior," journalist B.J. Mason described modern psychosurgical operations as "bizarre" and akin to the lobotomies of the 1930 to 1950s which engendered deleterious effects for a plethora of patients. Mason elucidated modern psychosurgery techniques as disproportionately foisted onto the Black community and particularly Black children. More than simply an overly invasive procedure, Mason described psychosurgery as a tool of pathologization, with emergent psychosurgical techniques of the 1960s and 70s being steeped in erroneous and racialized assumptions of Black individuals as violent and aggressive. Aimed at observing violence and developing measures to stop aggressive behaviors preemptively, these psychosurgical techniques were often levied as a way of controlling Black individuals and especially controlling those engaging in Civil Rights Movement protests. Interweaving patient case studies, photography, and interviews with neurosurgeons and psychiatrists, Mason's article exposes the resurgence of psychosurgical research as not a clinical measure but rather a means of social control of Black Americans. Drawing on written archival records, oral histories, and images, this paper explores the ways in which psychosurgery was employed as a means of racialized social control throughout the mid- to late-twentieth century in the United States. I demonstrate that psychosurgery was leveraged as a tool of pathologization, both reifying fallacious stereotypes about Black individuals and violence and functioning as a mode of social control towards protestors during the Civil Rights Movement.

A History of Electronic Health Records: Policy, Politics, and Power ***Allison Law, Yale University***

Electronic health records (EHR) are often presented as modern tools that can improve health outcomes by faithfully documenting medical encounters. Despite intentions to improve clinical outcomes, the EHR has reinforced and even created new structural inequalities. Considering the history of the EHR through a lens of structural competency– how social, political, and economic structures shape clinical interactions– raises the questions: who documents, who is being documented, and who has access to the EHR? These questions allude to the politics of memory and the politics of (non)documentation that condition different modes of clinical thinking. This paper situates the implementation of the EHR at Yale New Haven Hospitals within a broader national policy movement to digitize medical record keeping. Using training documents for medical students, nursing students, and medical residents from the 1990s to the 2010s, I show that Medicare-driven note-taking guidance centers "objectivity" in the name of hospital liability coverage, thus contributing to the loss of patient narratives. I also use these sources to show how a lack of systematic training on patient-centered documentation strategies leaves healthcare workers susceptible to burnout as they navigate what sensitive social history to include or omit. The EHR has been a site of contestation since its origins in the 1970s when patients challenged the accuracy of their medical records, nurses debated ethical documentation language, and physicians resisted insurance bureaucracy. Ongoing research in sociology and anthropology on Black birth work and mental health care provides potential solutions through "strategic non-documentation" to promote health equity while the EHR remains. Ultimately, I argue that understanding the history of the

EHR as a site of negotiation helps sustain continuous and intentional efforts to improve health equity.

Session Organizer:
Ana Cristina Betancourt, Yale University
Chair:
Marco A. Ramos, Yale University

075. HSS Distinguished Lecture: Conevery Valencius

Plenary Session
6:00 to 7:30 pm - Friday 14 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon C
Presenter:
Conevery Bolton Valencius, Boston College

SATURDAY, NOVEMBER, 15

076. HSS Chair's Breakfast

Breakfast

7:30 to 8:45 am - Saturday 15 Nov.
Sheraton New Orleans: Floor 3rd Floor - Maurepas

077. Registration Day 3

8:00 to 5:00 pm - Saturday 15 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon Registration Desk

078. Sciences of Environment from Earth to Mars

Contributed Paper Session

9:00 to 10:30 am - Saturday 15 Nov.
Sheraton New Orleans: Floor 4th Floor - Bayside ABC

Participants:

Battle Cry for Eradication: The Ascension of Invasive Biology in Late 20th Century America ***Wenzheng Fang, University of Notre Dame***

The ascendence of popularity of invasive biography and the quick embrace of it in most sectors of the American society at the end of the 20th century is one of the most glaring phenomenon in the history of recent ecology and biology. It is rare for natural scientist to be so successful in setting the agenda for the public and the state in such a speedy and effective way. This paper examines the history behind the momentum of invasive biology, from the 1984 international Scientific Committee on Problems of the Environment Conference to the consolidation of consensus on the control of invasive species in the society at the beginning of the 21st century, to analyze the forces that drove the changes. I argue that this momentum was shaped by several changes of historical currents towards the turn of the century, including the genuine concerns and care on unprecedented changes in the biosphere and the will to tackle with it that was cultivated by scientists, science writers and restorationists in the previous decades, as well as their techniques in developing a rhetoric to propagate an ever lasting horror of enemies within. With the world order and global capitalism rapidly evolving, both their care and fear met the desire of funding for the conservationists and restorationists, as will as the demands of an environmental management state to expand its power and find subjects to govern.

Science and Policy in Harmony: Shaping Environmental Strategies in Yugoslav Self-Management ***Tijana Rupcic, The Institute for the History of Science of the Polish Academy of Sciences, Warsaw, Poland***

The rapid technological advancements of the 20th century significantly altered humanity's relationship with nature, often under the assumption that industrialization would ensure complete control over the environment. However, as both the biosphere and technosphere operate under independent laws, this perspective proved inadequate. In response to environmental challenges, three primary approaches emerged: halting technological and economic growth, implementing corrective measures within existing systems, or developing a social model that eliminates conflicts between society and nature. While most Western nations opted for the second approach, socialist Yugoslavia provides a unique case study, where environmental policies were shaped within the framework of self-management. Following its expulsion from Cominform in 1948, Yugoslavia introduced a distinctive socialist economic system—self-management—in 1951. This model aimed to decentralize control by granting workers direct authority over enterprise management through elected councils. While environmental concerns were recognized as early as the immediate post-war period, industrialization and electrification took precedence. Only in the mid-1950s, did the more serious efforts to establish environmental policies become the concern of government officials and the scientific community. This study examines the evolution of environmental policies

within the Yugoslav self-management system, analyzing how ideological, economic, and scientific considerations intersected to shape sustainable development strategies. By exploring the three phases of self-management, this research offers a nuanced understanding of how socialist governance influenced environmental policymaking, highlighting the broader implications of decentralized environmental governance in socialist and post-socialist contexts. Keywords: Yugoslavia, self-management, environmental policy, socialist governance, sustainable development

A Planetary Sense of Place: Planetary Geologists and the Remaking of Mars from Above, 1964-1973 ***Billy Marino, University of California, Santa Barbara***

In the 1960s and early 1970s, planetary scientists in the US, particularly planetary geologists, reshaped the relationship between people on Earth and the Martian environment. They did this with data collected from flyby and orbiting spacecraft that facilitated a perspective of being at Mars from high above its surface, creating a planetary-scale perception of the “Red Planet”. This paper argues that the work of the burgeoning community of scientists creating scientific knowledge of the Martian surface environment changed the kind of place it was, simultaneously recognizing its unique environmental past and reconnecting it with Earth’s. Without physically stepping even a robotic foot on the planet, planetary scientists used spacecraft data – particularly images of surface features that were part of photogeological observational techniques – to create new narratives about the Martian environment. The planetary scientists of Mars worked amidst the changes of Cold War science and a growing popular interest in environmental concerns to develop techniques that were adapted and built alongside those developed to study the Earth and Moon at the planetary scale. Mars itself defied expectations and challenged planetary scientists’ abilities to use it as a field site and object of scientific study. It presented cratered landscapes suggesting a long dead planet; dust storms that interfered with robotic exploration; and volcanoes, glaciers, and canyons indicating the components needed to form life were possibly part of Mars’s deep environmental past. This encounter between planetary geologists and Martian environments reshaped scientific and popular interpretations of Mars as a place humans could understand.

079. Technologies of Visualization

Contributed Paper Session

9:00 to 10:30 am - Saturday 15 Nov.

Sheraton New Orleans: Floor 3rd Floor - Borgne

Participants:

Simulating Weather and Natural Disasters in Early Hollywood Special Effects, 1923-1939 ***Kristine Ericson, Yale University***

The Hollywood movie industry has produced some of the most widely consumed images of built and natural environments since the early twentieth century, but historians of science and technology have largely overlooked Hollywood as a legitimate producer of knowledge. In this paper I take Hollywood seriously as a site of knowledge production about geophysical forces. I argue that early movie studios, seeking efficiency and predictability in the 1920s and 1930s, encouraged newly-organized special effects departments to develop standardized techniques for simulating weather and geophysical events such as floods, earthquakes, tsunamis, and volcanic eruptions. Despite the standardization of some simulation techniques, effects workers’ everyday workflows were heavily based in an intuitive, trial-and-error practice of tinkering, testing, reflection on personal experience, and visual comparison with references. When staging geophysical events, effects technicians contended with the physical properties of water, air, fire, and other fluid or moving materials. These technicians adapted or designed

construction methods, filming techniques, and equipment (wind and rain machines, smoke and fog producers, water tanks, wave generators, pyrotechnic devices) to corral and manipulate fluids, gases, and collapsible structures in relatively predictable, safe, and reproducible ways. They commonly adjusted these methods of geophysical simulation, creating new solutions to address the specific spatial, temporal, and narrative demands of each picture.

The Art of Medical Photography: The Transition from Art to Science in Medical Photography 1850-1900 ***Sookyong Ko, University of California, San Diego***

Where does art stop and science begin? While photography was celebrated as an ideal medium of scientific representation quickly after its birth, early medical photographs showcase a strong influence of commercial art photography. This paper points to the first 50 years of photography when medical photographers were mostly physicians who learned the art of photography as amateurs or commissioned artists who practiced photography as commercial art. Looking into the technical developments, commercial art system, and emerging professional organizations in the medical art industry in the United States during 1850-1900, this project overviews the early ages of medical photography, where artistic conventions from portrait art and portrait photography persisted, and medical photographers started to differentiate themselves from other ‘artistic’ photographers. Pointing at the point of departure from art to science, this project surveys the modern ‘scientific’ way of seeing that was born from a strange marriage between artistic affordances and scientific necessities.

Words into Form: A 3D Visualization of the Heart in Galen's Anatomical Writings ***Gabriele Torcoletti, Hebrew University of Jerusalem***

This talk presents an original 3D anatomical model of the heart based on Galen's descriptions in Anatomical Procedures (AA 7.3-12) and On the Utility of the Parts (UP 6). These texts provide complementary insights: AA emphasizes descriptive anatomy, while UP adopts a physio-anatomical approach with teleological implications. The model reconstructs Galenic anatomy and serves as a tool to explore broader questions of cardiac physiology that remain unclear in his writings. For instance, Galen describes pits (bothynoi) in the septum leading to tiny perforations (trēmata), allowing blood flow between the heart cavities. This anatomical understanding was crucial for his theories of pneuma, soul, and blood circulation. It was grounded on anatomical observation, but modern interpretations vary. Modeling these structures clarifies the decisions involved in reconstructing Galenic anatomy and its implications. The talk also examines metaphoric language in Galen's anatomical discourse. Terms like 'auricles' (ōta), shared with external ears not for morphological or functional similarity but spatial analogy, show how rhetoric shaped anatomical concepts. Similarly, Galen describes the 'mouths' (stomata) of the heart – vessel openings into the cardiac cavities – using a metaphor that emphasizes their role as passageways. Rendering these metaphors into tangible forms provides new insights into Galenic reasoning. This interdisciplinary research blends philology, empirical observation, and collaboration with anatomists and digital artists to develop a nuanced understanding of Galen's thought. By situating digital reconstruction within broader methodological debates, the talk shows how 3D modeling can enhance our grasp of Galenic anatomy and physiology, serving as both visualization and investigative tool.

080. Finding Insects in the History of Science

Contributed Paper Session
9:00 to 10:30 am - Saturday 15 Nov.
Sheraton New Orleans: Edgewood
Participants:

‘Hunting Insects in the South Seas’: Lucy Evelyn Cheesman (1881-1969) and Local Papuan Knowledge in Papua New Guinea ***Leore Joanne Green, Dan David Fellowship***

Local indigenous knowledge has been increasingly appreciated by scientists. During the early twentieth century however, this was usually not the case—most Western travel narratives written by scientists in the early twentieth century were at least somewhat disparaging towards local knowledge. This paper looks at one English woman who presented an alternative approach. Lucy Evelyn Cheesman, born in 1881, studied for a two-year-course of entomology at Imperial College, London, followed by several decades of unpaid volunteership at the British Museum (Natural History), during which she went on five long expeditions to New Guinea between 1924 and 1954. During her expeditions, Cheesman lived for long periods with local people in the area she was studying. She formed friendships and was interested in the people she met, their beliefs, and customs. In her scientific writing she made it clear that her interest was not ethnological (as was often the case at the time), but rather pragmatic. The people of New Guinea, she argued, had special knowledge and unique connection to the landscape they lived in. Both must be respected, she emphasised, and can help the scientist. In one of her articles, she described how Papuans are carefully educated as children on the landscape around them and all living things in it—they had local knowledge of trails, conditions, and politics, all of which were necessary for the travelling entomologist. This paper thus asks, what can Cheesman’s case tell us about approaches to local knowledge—both in the early twentieth century, and today?

Waterscape, “Beeboat,” and Migratory Beekeeping: The Localization of Modern Beekeeping Practice in China (1912-1937) ***Haixing Wang, University of Birmingham***

In 1912, the introduction of Western scientific beekeeping, characterized by the utilization of movable-frame hives, along with a European native bee species (Apis mellifera L.), marked the beginning of modern apiculture in China. Yet this modernization was by no means a straightforward appropriation of foreign technology but was transformed through the local environment and material practices among humans and nonhumans. This paper examines the ways of knowing and practicing of Hua Yizhi (1893-1956), an influential apiculturist who kept Apis mellifera L. colonies in Wuxi. In the late 1910s, Hua effectively integrated the waterscape of the Lower Yangtze River delta and the spatial-temporal distribution of nectar plants into his migratory beekeeping practice by inventing “beeboat” (fengchuan). I show how the natural environment, as well as the materiality of beekeeping (including the structure of beehive, transportation tools, bee’s body and beekeepers’ embodied techniques), shaped the localization of modern beekeeping practice in China. Crucially, by drawing on the cross-pollination between history of science and environmental history, this paper extends the existing scholarship by considering environmental dimensions in studies related to the history of science in twentieth-century China and Asian modernity, a growing but still underexplored intersection.

The Mosquitoes of Major Perry's Malarious Measurements ***John Mathew, Asian University for Women; Rutuja Anil Rokade, Archives of the National Centre for Biological Sciences, India***

This paper revisits a seminal study conducted by Surgeon Major Edmond Ludlow Perry (1872-1957) of the Indian Medical Service, during the years 1911-1912 in the southwestern region of the present day Indian state of Odisha (formerly Orissa) on the prevalence of malaria in that part of the erstwhile Madras Presidency under the governance of the British Crown, and published in 1914, from the perspective of anopheline species

richness. The present pilot study, including four field visits in January, April, August, and December, 2025, takes into account synonymy since established in relation to a number of species deemed separate by Perry during his work in determining comparisons in the early 20th century, and governmental interventions after Indian independence undertaken in the interim, particularly from the 1990's, to stem the spread of malaria in the region. The paper is an effort to explore how a study can be re-examined from the point of view of work prosecuted in the field, rather than more familiar instances of re-undertaking experiments in the laboratory, where controlled circumstances are easier to replicate. Differing climatic conditions in each short field visit, particularly from the point of view of weather and rainfall, may have played a role in differing species richness encountered, and these are placed in comparison with Perry's observations at comparable times during his original study.

081. "Scams" and Epistemic Denial in the History of Science

Contributed Paper Session
9:00 to 10:30 am - Saturday 15 Nov.
Sheraton New Orleans: Napoleon A1

Participants:

Accusations in the Early Philosophical Transactions, 1665-1840 ***Robert Fyke, Centre Koyré, Cermes3***

This paper describes the changing use of accusations of non-scientificity in the early Philosophical Transactions of the Royal Society of London. The period encompasses the first continuously published natural philosophy journals in Europe up to the point in the 19th century when the term scientist came into use. We will need a set of criteria to interpret diverse accusations over such a long period of time. From natural histories of monsters to quack doctors, from the normal distribution of errors to metallurgic fraud, and from frightening meteorological events to fictional archaeologies, in every case an Accusation was made by a Claimant against a Defendant during a specific Duration. Durations can range from present-day controversies to literature reviews involving a non-scientific past. Claimants can involve authors playing various judicial, scientific, historical, and editorial roles in their own narrative. Defendants are a more ambiguous category, often involving unnamed individuals and abstract groups. And Accusations can involve memorable rhetoric mobilizing artistry, deceit, excess, intelligence, outsiders, politics, religion, salesmanship, sexuality, scientificity, and social status in categories of accusations that associate specific terms with specific sciences. For example, in the Philosophical Transactions from the late 17th through the early 19th centuries, we can notice how the term monster, originally defining a unit of instruction, omen, or remembrance, changed into descriptions of birth defects and non-viable sexual combinations in natural history that called into question a well-organized universe.

Consistency, Empirical Adequacy, and Christian Reconstructionism: The Role of Epistemic Values in Science Denialism ***Mallory Anne Hrehor, University of Cambridge***

Many view epistemic values as a crucial aspect of good and fruitful scientific inquiry. These kinds of values, such as consistency and empirical adequacy, are often seen to be the hallmarks of good theories, potentially aiding in some kind of demarcation between "good" or "bad" theories. My aim in this paper is to examine the use of these epistemic values in groups which are often classified as "science denialist". I will be looking, in particular, at a group of Christian reconstructionists based in the Pacific Northwest in the U.S. from the late 1970's to the present. This group is often classified as a science denialist group due to its rejection of evolution and climate change, its belief that the earth is less than 6,000 years old, and its anti-mask and anti-vax position during the 2020 pandemic. This group has started its own,

quickly expanding, education movement, with over 475 affiliated K-12 schools. By examining the vast output of literature from this group on their beliefs around science, as well as the science curriculum they have published through their own publishing house, it can be shown that this group also highly prioritizes epistemic values, like consistency and empirical adequacy. In fact, I will argue that, based on the literature from this group, their extreme emphasis on these epistemic values actually contributes to their science denialism, which opens up avenues for questioning whether epistemic values, like consistency and empirical adequacy, should be seen as universally beneficial in scientific theories.

Scams, Pranks, and Other Indigenous Scientific Methods ***Eli Nelson, Massachusetts Institute of Technology***

The December 10, 1903 unveiling of Cyrus Dallin's Medicine Man statue in Philadelphia was a thrilling affair. Not only did locals get a peak at the enormous bronze Native man on horseback, but they had the opportunity to hear a real Indian speak on the topic. However, Francis LaFlesche (FLF) was in no mood that morning to indulge an audience ready to believe whatever he told them. After decades of trying to ascend the academic ladder from informant to scientist, he was ready to set the record straight: settlers had no clue who medicine men were. They had failed to locate authentic Indigenous intellectual authorities due to their inability to properly make use of native informants as instruments of knowledge production. How absurd would settler culture appear, LaFlesche queried, if researchers spoke to con-artists and took their word as ethnographic truth? Evidence of Indigenous scams abound in the archive of American science. Ranging from ironic mistranslations to elaborate performances for a quick buck, Indigenous people have often tried to profit and derive amusement from violent colonial epistemologies. In this talk, I explore FLF's career and methodology as an Omaha informant and later ethnologist. LaFlesche's legacy was not the eradication of Indigenous scams in science, but the intellectual fortification of Indigenous charlatanism as a scientific method. In its output, Indigenous charlatanism inundated settler institutions with incomprehensible data, while its input was structured according to complex and embodied theories of the epistemological relationship between instruments, objects, and people.

082. Indigenous Knowledge in Spanish America

Contributed Paper Session

9:00 to 10:30 am - Saturday 15 Nov.

Sheraton New Orleans: Floor 3rd Floor - Napoleon A2

Participants:

Zero to Infinity: The Mayans Concept of Zero and its Role in Calendrical Developments ***Javier Armas, UCB CSTMS***

Within the important growth in non-European mathematical historiography recognizing Mesopotamia, Islamic-Arabic, Chinese, and Indian mathematics, the Mayans are continuously neglected. Anthropologists and archeologists have established with over a century of research, the advanced character of Mayan calendrical mathematics, utilizing zero and calculus level math, representing the most advanced mathematics in the Amerindean Americas. The Mayan calendrical mathematics and its concept of zero Nik,(a shell) played a central role in developing the highly precise three interlaced Mayan calendars, and its built-in advanced mathematical systems. Historians have recently dated the Mayan concept of zero much earlier to 1,000 BC, establishing a larger time frame for the development of the Preclassic (1,000 BC to 250 AD) Mayan lunar 260 day Tzolkin and 365 day solar Haab calendars, which later formed the third Classic (250 AD to 900 AD) Long Count calendar. This paper explores the multi-meaning of the Mayan concept of zero that developed a complex calendrical mathematical system, weaving three distinct calendars in unison, central to shaping cultural politics and historical

consciousness. The zero concept was at the epicenter of the convergence between calendrical mathematics, the Mayan epistemology of time, shaping political and religious views. Across eighteen centuries, the multi-meaning of zero evolved from symbols to numerical place holders, from shell images to infinity as a concept, forming a unique Mayan epistemology of mathematics.

History from Knotted Strings: Quipus, Inca Numeracy, and Accounts of Andean Conquest ***Manuel Medrano, Harvard University***

Quipus (also khipus or kipus; "knot" in Quechua) are bundles of knotted strings that were used by the Incas and other pre-Columbian Andean cultures for recordkeeping and information transmission. Though alphabetic writing, which was introduced with the Spanish conquest, is known to have gradually replaced quipus for everyday use across these domains, recent scholarship has called attention to the notable longevity of pre-conquest quipu traditions and practices in a variety of colonial Andean secular and religious settings. This paper situates and expands these findings by pursuing the decipherment and reconstruction of Inca numerical practices from surviving pre-conquest archaeological quipus themselves. Correlating colonial chronicles with the Inca-era material record, I suggest, permits more specific and substantive statements about Inca numeracy and its relation to colonial-era Andean recordkeeping practices, while also questioning the conquest-era debut of alphabetic writing as the conventional boundary distinguishing the disciplines of archaeology and history in the Andes. To this end, I also survey the ongoing use of radiocarbon dating to chronologically sequence Inca and post-Inca quipus, thereby assessing their historical transformations and treating them as Andean primary sources. For historians of pre-modern science, the Inca quipu compels an Andean reassessment of the relationship between literacy, numeracy, memory, oral history, and situated knowledge.

Indigenous Canoe Building/Knowledge, River Navigation, and The Encounter of Knowledge during the Spanish Conquest of the New World ***Federico Castaño Vargas***

Indigenous canoes are one of the least known and studied tools (technologies) of the Pre-Hispanic period, partly due to the difficulty in unraveling the meanings of glyphs and iconography. Furthermore, Spanish conquerors categorized the indigenous canoes as inferior (as seen in the Spanish Chronicles of the New World). That is because in Western culture, technology and its developments are perceived in a linear and ascending trajectory, meaning that each innovation ameliorates the previous, and thus technology can only improve. Consequently, for the Spanish conquerors during the Spanish Conquest of the New World, the caravels represented an enhancement over the indigenous canoes, and therefore, the latter were devalued. Even so, another position allows representing technological advances with breaks or discontinuities, and therefore, technological advancements can move in different directions. As a result, depending on the context, individuals/societies occasionally must revert to an older technology and abandon the contemporary because the latter does not permit the achievement of a goal or solve a problem. As an example, during the Spanish Conquest, it was the indigenous canoe, not the caravel, that met the river mobility needs of the Spanish conquerors. However, because the Spanish usurped the canoes with the sole purpose of accomplishing their agenda, the rich symbolic representations given to the canoes by the indigenous peoples were ignored. Thus, indigenous canoes are an exceptional primary source that, when investigated, reveal new insights related to indigenous canoe building/knowledge, river navigation, and the encounter of knowledge during the Spanish conquest of

the New World.

Reproductive Medicine and Indigenous Knowledge in 18th-Century Charcas, a Mining World ***Annelise Walker, Pennsylvania State University***

The Audiencia of Charcas is best known by historians for its silver mines, which made it the crown jewel of the Spanish Empire. This paper explores the impact of those mines on reproductive health in Charcas, but also Indigenous Andeans' knowledge of how to live in their toxic world. To that end, I analyze an 18th-century manuscript by the Spanish physician-botanist Martín Delgar, who treated miners in Potosí. “Tratado de la calidad de la yervas, animals, y piedras” catalogs the medicinal uses of 154 plants, animals, and minerals, each named in Quechua and Aymara. Nearly half of the entries reference reproductive medicine, with most remedies used to induce or stop menstruation, increase fertility, or care for postpartum mothers. I work from a copy of this manuscript produced by Felipe Loayza de la Vega, a priest and hacendado, making the document ideal to see the converging interests of diverse groups—Indigenous healers, lettered Europeans, creole elites, the Church—in reproductive knowledge. Why was reproductive medicine so important to them all? Colonial Charcas was a mining world, through and through, where silver and mercury penetrated the water, soil, and air, causing infertility and irregular menstruation. Thus, I argue that alongside brutal working conditions and the forced relocation of Indigenous men, the violence of Spanish imperial mining included reproductive violence that extended far beyond Potosí. However, violence is not the only story: this paper shows that the gravity of this reproductive injustice was met by a remarkable depth of Indigenous reproductive knowledge.

083. Recipes and Epistemological Exchange in Premodern Asia

Organized Session

9:00 to 10:30 am - Saturday 15 Nov.

Sheraton New Orleans: Floor 3rd Floor - Napoleon A3

Once overlooked, medicinal recipes have in recent years assumed a central place in the history of science. “Recipe knowledge,” as it has come to be known, is born from firsthand observation, experimentation, and hands-on experience, which is then distilled into concise “how-to” instructions. As artifacts of material and manual engagement, medicinal recipes can offer valuable insights into histories of practice, involving a wide array of actors—artisans, physicians, healers, homemakers—and conducted in diverse sites of knowledge production—workshops, kitchens, apothecaries. However, if the history of recipe knowledge has been dominated by scholarship on early-modern Europe, we redress the imbalance by bringing together scholars working on recipes in Asia. Shifting the focus beyond Europe not only recalibrates our understanding of recipes as a genre but also offers new methodological perspectives for studying them. Our panel includes historians specializing in medicine, technology, and religion. We are particularly interested in how medicinal recipes emerge from collective knowledge and epistemological exchange, bridging domains of expertise often seen as distinct. We also explore how recipes convey embodied and material knowledge in ways that made them accessible to a wide range of practitioners. Finally, our panel contributes to ongoing discussions about the promises and pitfalls of a hands-on approach to the history of recipes. By centering recipe traditions from India, Tibet, China, and Korea this panel rethinks both the content and the methodologies of recipe history.

Participants:

Pigments, Poisons, and the Making of Buddhist Art in Early-Modern Tibet ***Briana Brightly, Harvard University***

By the mid eighteenth century, Buddhist artisans in Tibet began to write about their craft in a new materialist register, recording recipes and techniques with a precision previously reserved for medical and alchemical texts. Whereas earlier Tibetan treatises on Buddhist image-making had primarily concerned ritual prescription—the

system of sacred proportions, consecration, and the divine origins of artistic practice—these new texts evidence a markedly different ambition. They provide, for example, recipes for pigments, methods for detoxification, and detailed instructions on the observation and manipulation of nature—topics which had rarely been broached previously. Among these, the artist-monk-physician Deumar Geshe Tenzin Puntsok's (b.1673) Giving Hues to Flowers and Bringing Out the 100,000 Colors of Rainbows stands out, both as a compendium of practical knowledge and as a testament to the shifting self-presentation of the Buddhist artisan. I argue that the emergence of such texts was the result of the unprecedented collaborations between physicians and artists during this period. The Tibetan medical tradition had long relied on recipes as a means of codifying and transmitting knowledge. Artisans, I suggest, adopted these strategies to effectively convey their own forms of embodied knowledge through the written word. This amounted to a new self-presentation of the Buddhist artist, no longer cast solely in the mold of the religious adept but also as an experimenter, a master of materia medica, and investigator of nature. In tracing the epistemological crossings between medicine and Buddhist art, this paper sheds light on the artisanal sciences of early-modern Asia.

"My Humble Explanation of Things": A Korean Physician's Collecting of Chinese Recipes, Foods, and Useful Things ***Hyeok Hweon Kang, Washington University in St. Louis***

Sometime before 1720, a royal physician named Yi Sip'il 李時弼 (1657–1724) kept a detailed recipe book of objects, medicines, and techniques which he encountered in his travels to China. Titled My Humble Explanation of Things 謏聞事說, his illustrated treatise demonstrates the genre of recipes as a crucial vehicle for epistemic exchange between the Qing Chinese (1644–1912) and the Chosŏn Koreans (1392–1910). For the Korean physician, recipes on medical techniques were most crucial. In a section titled "Recipes for Food Therapy," he documented how to make lotus porridges, egg soups, and garlic pickles among others, noting that these were tasty and nourishing for the body. But the recipe collection was even more ambitious. It included a section on how to improve ondol (floor heating) systems based on the Chinese kang bed-stoves; a parade of Chinese objects such as fishing equipment, bellows, sieves, soap, and oil presses to be reverse-engineered; and a disorderly list of craft techniques and animal rearing methods. Most surprising, a comparison of editions shows that this was a collective effort and an intellectual "movement." Through recipe writing and "trading," a domestic network of knowers and healers deepened in Chosŏn. This included high-ranking civil officials, petty military officers, royal chefs, princes, and even slaves who all partook in the knowledge making process. The traces they left on the collection show that recipe was the primary epistemic medium for new collaborations across political and social borders, between China and Korea, and from elite literati down to slaves in Chosŏn society.

Powdered Pearl, Beeswax, and Fish Congee: Recipes and Embodied Precarity in a Late Ming Official's Lost Pocketbook ***He Bian, Princeton University***

This paper examines seven recipes inscribed backwards toward the end of Cotton Titus D17, a pocket-sized manuscript in Sir Robert Cotton's Library known to previous bibliographers only as the "little Chinese book" (Liber parvus Sinensis). While it remains a riddle as to how this Chinese pocketbook ended up in early 17th-century England, numerous clues contained in the manuscript itself suggest that the owner of the pocketbook was likely a late Ming official in charge of a coastal district. The official used the pocketbook to record actual proceedings of litigation going through his jurisdiction as well as drafts of outgoing official documents from his office, including his

own petition for an early retirement on account of illness. This reconstructed context sheds new light on the seemingly random seven recipes he chose to record in the pocketbook, offering a case study of how vernacular variations of standard ingredients and pharmaceutical processes came to be preserved by lay users. The lack of uniformity in length, format, rarity of ingredients, and level of pharmaceutical details also testifies to the elastic and flexible nature of recipes (fang) that far exceeded the confines of therapeutical prescriptions in earlier medical canons. Through telling the stories of both the manuscript owner and the recipes contained in it, I argue that it is possible to make a limited historical conjecture over the extent of concern and precarity on the part of the educated male elite and their social world in the late 16th century.

Reflections on the Purpose of Recipes in Premodern South Asia ***James McHugh, University of Southern California***

A number of what we might nowadays call recipes survive from premodern South Asia: lists of ingredients, sometimes with quantities, and sometimes with instructions on processing. Rarely, however, do these texts resemble modern recipes. How might we go about understanding these texts? Were these plausible instructions, or did the textual production of such “recipes” serve other purposes? In order to answer these questions, the paper will review a number of different recipes in Sanskrit for alcoholic drinks from different genres and periods. What work are these recipes doing? Why did people produce and preserve these texts? What, if anything, were people supposed to do with the recipes? This paper argues that in some cases the recipe sets a legal/taxable standard (like German beer purity rules); in one case we find a relatively practical recipe that above all anchors a quite literary text in local realia; sometimes the recipe aligns beer making with soma pressing for ritual purposes; or other recipes emphasize certain ingredients for theological or pharmaceutical purposes. These Sanskrit recipes were composed approximately between the turn of the Common Era and 1200 CE, and while we have a rich textual record from this period, certain kinds of analysis, such as locating the recipes within the social history of the period are very difficult indeed. Nevertheless, through close reading we can observe interesting patterns of intertextuality (religious, legal, medical), and developments in literary history. Moreover, the paper argues that despite the many challenges here we can still infer some basic details of brewing technology from these recipes.

Session Organizers:

Briana Brightly, Harvard University

Hyeok Hweon Kang, Washington University in St. Louis

Chair:

Pamela H. Smith, Columbia University

084. Sciences of Mind

Contributed Paper Session

9:00 to 10:30 am - Saturday 15 Nov.

Sheraton New Orleans: Napoleon B1

Participants:

Legal Insanity and Psychiatric Knowledge Integration in Late Qing Legal Reform (1901-1911) ***Yujie Pu, University of Illinois Urbana-Champaign***

This paper explores the implications of incorporating Western psychiatric knowledge into the legal framework in the early twentieth century Qing China (1644-1912). In 1909, the Qing court issued an imperial edict requiring provincial offices to provide feedback on the draft of the New Qing Criminal Code (Daqing xinxinglü caoan) completed in 1907. This code, part of the Qing government’s efforts to modernize the legal system and establish a constitutional monarchy, introduced a significant legal innovation: the recognition of mental illness (jingshenbing) as a category exempting individuals from criminal punishment. However, provincial officials’ detailed annotations revealed conflicting views on how to define mental illness and assess criminal responsibility. This paper draws on

legal commentaries, administrative reports, medical educational reform records, European medical conference agendas, cultural exchanges with Japan, and news reports to trace the circulation of psychiatric knowledge. Rather than a simple adoption of Western medical theories and legal principles, the Qing state's approach to legal insanity reflected a process of self-Orientalization, in which Chinese legal practices and Chinese medical expertise regarding insanity were framed in contrast to European and Japanese models. This approach generated epistemological confusion among state officials, particularly those who managed mental illness within the legal system. Moving beyond the simplistic binary of "tradition" versus "modernity," this paper argues that the management of mental illness in the last decade of Qing China was not an exclusively modern and Western approach to insanity. Instead, it was a product of Chinese interpretations of Western concepts of legal insanity.

Republican Constellations: Psychiatry, Gender, and Statehood in Turkey, 1923-1950 ***Kutlughan Soyubol, Bogazici University***

The history of modern Turkish psychiatry has been expanding over the last years with novel studies engaging with the subject not only within social or institutional frameworks but also by tracing the intricate relations between psychiatry and the modern Turkish (secular-biopolitical) state. Following in the footsteps of these works, this paper focuses on Mazhar Osman [Uzman] (1884-1951), the so-called 'father of modern Turkish psychiatry', and the indisputable psychiatric authority of the early Turkish Republic. The paper specifically aims to scrutinize Mazhar Osman's 'scientific' deliberations on gender and sexuality which, on the one hand, predicated on patriarchal takes of such issues, and on the other, overlapped with early Turkish republican policies of 'women's emancipation'. Problematizing the assumption that the equality between sexes is inherent to the logic of modern democracy and secular-liberal rule, the paper historically contextualizes Mazhar Osman as a scientist of his era as well as an expert of the emerging Turkish modern state, serving the (Kemalist) state in its biopolitical project of alleviating the defects and delinquencies inherent within its population. This process no doubt included defining and classifying abnormal psychiatric conditions and producing knowledge on how to cure and regulate them. Through a thorough reading of Mazhar Osman's numerous psychiatric publications, the paper accordingly reflects on the entanglements between science, biopolitics, patriarchy, and nation building under the early Turkish republic; and it inquires on the critical possibilities that such a historical precedent might provide in pondering our current epistemological or discursive predicaments, particularly on the issues of emancipation and scientific objectivity as well as their political entanglements.

Revisiting Charcot on the Centennial of his Death ***Daniela S Barberis, North Central College***

On the centennial of Charcot's death, in 1993, I wrote an article in Osiris which analyzed the commemoration of Charcot as a founding father of neurology up to that point in time. In this paper, I will offer an overview of the literature since 1993, which has become broader (new disciplines, such as art history and performance studies have produced works on Charcot) but has continued to reproduce significant features of older narratives, despite critical approaches that tried to undermine this presentation of Charcot. The "legend" of Charcot started during his own lifetime and is particularly connected to his work on hysteria and hypnosis and to his association with Sigmund Freud, who played a role in propagating the image of a visually fixated Charcot incapable of listening to what his patients were telling him. The valorization of his work on neurology and the rejection of his work on hysteria continued a trend started by his own students immediately after his death,

when the carefully constructed theory of a neurologically-caused multi-phase hysterical disease unraveled. Yet Charcot and the spectacle of hysteria continue to fascinate, and the number of works written about him continue unabated. Charcot is still treated as a “genius”—now a genius of “choreographic analysis,” the “stage manager of the Salpêtrière” (Marshall, 2016). This paper will examine what has changed and what has stayed the same in the treatment of this historical figure, including the fact that the “great man” approach to Charcot continues unabated, despite its waning fortunes in historical approaches in general.

"Living in the Rupture": Cycles of Grief, Mourning Absence and the Psychology of Intergenerational Trauma ***Angélica Clayton, University of Pennsylvania***

This paper examines a group of psychiatrists, psychologists, sociologists and social workers working on theories of intergenerational trauma and the family in the last half of the 20th century. Originally developed from work with Holocaust survivors and their children, early theories described intergenerational trauma using an event-based and family systems model built on cybernetic explanations of the human to describe healing as a process of mourning and integration. This dominated the landscape of intergenerational trauma research until the 1990s, when Black and Indigenous psychiatrists and social workers raised critiques that this model could not account for their experience since their trauma was ongoing and omnipresent. These researchers pointed out that paths for healing from intergenerational trauma assumed daily environments were safe for all families, that the traumatic experience was “in the past,” and that the trauma was a singular, circumscribed moment in time. How, they asked, does one mourn and integrate the sheer amount of unknown losses arising from the Transatlantic Slave Trade and settler colonialism? How does one integrate absence? How does one properly mourn and heal while the violence is ongoing? Building on these questions and the alternative frameworks for healing they ushered into being, this paper scrutinizes the idealized models of childhood development, mental illness, and the family that are embedded in medical ideas of intergenerational trauma and serve to over-pathologize poor families of color in the United States.

085. Solidarity and Labor in 20th Century Science

Contributed Paper Session
9:00 to 10:30 am - Saturday 15 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon B2
Participants:

The Brain of the Poor. Genesis of a Concept. ***Jorge Lazareff, University of California, Los Angeles***

Research on the effects of socioeconomic stressors (SES) on the developing brain is a robust subject of academic inquiry. We searched for the publication that proposed such a link. We traced back the references of 127 relevant papers and reached Smiley Blanton's 1919 paper, "Mental and nervous changes in the children of Volksschulen of Trier, Germany, caused by malnutrition." In 1919, the Department of Sanitation of the American Army of Occupation stationed in Trier, a town near the western front, planned to document the anthropomorphism of children affected by the war. The schoolteachers shared that their students had decreased school performance. His superiors appointed Lt. Blanton, M.D., to follow the lead of this story. He noted that a failed potato crop in 1916 was a prelude to the war years when milk consumption fell six-fold. Blanton's study suggested a correlation between SES and school performance. In the 43 pages of his paper, abundant data supports the title's statement. In 1963, citing Blanton, Stoch & Smythe published "Does undernutrition during infancy inhibit brain growth and subsequent intellectual development?" The paper is methodologically imperfect but has 461 citations. In 1966, citing both papers,

Blanton's and Stoch & Smyth's, Brown reported on the diminished brain weight of Uganda's malnourished children. The 1996 prominent social sciences paper, "Malnutrition, poverty, and intellectual development," by JL Brown & Pollit, cites Stoch &Smyth. In 1999, Benitez-Bribiesca reported on abnormal dendritic branches of Mexican malnourished children without referring to any of the mentioned predecessors, thus accentuating Blanton's relevance

Between Rehabilitation and Exploitation: "Labor Therapy" as a Tool of Soviet Carceral Eugenics ***Alexandra Noi, University of California, Santa Barbara***

The Second World War was particularly hard for the prisoners incarcerated in the Soviet Gulag labor camps: cases of malnutrition and starvation skyrocketed. To treat sick prisoners, the Gulag doctors suggested enriched nutrition, excess intake of vitamins, physical activity, and, remarkably, "labor therapy." How could a disease that was linked to hard labor in the camp be treated with labor? This paper seeks to probe the complicated motivations and justifications of the camp doctors in suggesting labor as treatment. I explore how doctors, many of whom worked in camp hospitals in the status of convicts, navigated the fine line between rehabilitation and exploitation. By analyzing studies on "labor therapy" at the Scientific-Research Laboratory established within the Northern Railway Camp, I show that its carceral version built on the fields of physiology of labor, psychology of labor, and labor hygiene, as well as Pavlovian experiments with conditional reflexes and "higher nervous activity," and had some overlap with Western occupational therapy. The Soviet sciences of labor can be traced back to the 1920s developments in "visionary biology" – biomedical sciences that understood human nature as plastic and devised technologies to bring the new future and a futuristic human being into life. Coopting the Soviet ideological discourse of labor and human plasticity, the Gulag doctors designed biological solutions to disability of prisoners-workers. The doctors saw reversibility of patients' condition as plasticity of human bodies and minds. They advanced the power of science to overcome limitations of human nature with nourishing and nurturing interventions.

Bridging Science and Society: The Transnational Connections of People's Science in India ***Albert Varghese, Indian Institute of Technology Madras (IIT Madras)***

This paper examines the transnational intellectual genealogy of the People's Science Movements (PSM) in India by tracing their ideological connections to the Visible College (Werskey 1977) and the Social Relations of Science (SRS) movement. Emerging in the 1960s, the PSMs conceived science as a tool for socio-political transformation in postcolonial India and is distinct from conventional science popularization and communication movements due to its political character, anti-capitalist and anti-imperialist stance, commitment to scientific temper and secularism, and rejection of romanticized views of traditional sciences (Nanda 2003). This distinction is particularly evident in the work of the Kerala Sasthra Sahitya Parishad (KSSP), the largest PSM in India. The KSSP promoted critical engagement with science, staged science theatre, and intervened in social issues like the anti-dam movement in Silent Valley and the Bhopal industrial disaster. I argue that the People's Science Movements can be understood as efforts to bridge the 'two cultures' (Snow 1959) in the developing world, seeking to unite the sciences with the arts and humanities in addressing social issues, drawing on the ideological legacies of the Visible College and the SRS. Through archival sources, oral interviews, and writings of J.B.S. Haldane, J.D. Bernal, and Joseph Needham and Indian science activists, this paper explores how ideas about the social function of science circulate by examining the interconnection between the radical scientists of the SRS Movement in interwar

Britain and the People's Science Movements in postcolonial India.

Code for Comrades: Union Patronage of Information Science, and a Critical History of the "User" ***Emil Flato, NYU***

At the turn of the 1970s, the Norwegian computer scientist Kristen Nygaard embarked on a long-term collaboration with the labor unions on worker-centered informational design. Nygaard drew on his insider's perspectives from the security establishment and management consulting to warn the labor movement about the emergence of new digital planning tools, budgeting, strategy, and automation practices. The goal was to develop a knowledge strategy and research program under union patronage, closely coordinated with the labor party, This work laid the foundations of the Scandinavian School of System Development's participatory information design, a long-standing alternative to the corporate, top-down tradition of User Experience (UX) that came to dominate in the Silicon Valley. Union patronage of knowledge production is an underexamined topic in the history of science. In this paper, I will focus on how Nygaard's affiliation with unions and the worker perspective shaped his approach to the "user" in information design. The "user", I argue, is a central figure in digitalized societies, a form of subjectivation of comparable importance to the "citizen", the "voter" or the "worker". Defining the "user", however, was simultaneously a matter of politics and expertise; Nygaard recruited anthropologists to aid the mediation between factory workers (and in his second project, hospital nurses) and computer scientists. By insisting on the specificity of working-class users, the Scandinavian School beckons us to question the generality of the "users" coproduced by more commercially oriented information science.

086. The Science and Rhetoric of Climate Change

Contributed Paper Session
9:00 to 10:30 am - Saturday 15 Nov.
Sheraton New Orleans: Napoleon B3
Participants:

Modeling the Carbon Cycle, 1953-1981: A Foundational Debate in Modern Climate Science ***George Borg***

This is an HPS paper about the connection between scientific rationality and the temporality of scientific practice. I discuss the process by which scientists acquire suitable means to their ends when embarking on research in a new domain. By way of an analysis of an important case in the early history of modern climate science, I show that this process is far from self-evident. Guy Callendar is famous for his claims that fossil fuel combustion was increasing the global atmospheric carbon dioxide concentration and thereby causing a rise in global average atmospheric temperature. Less known is the fact that these claims sparked a vigorous scientific debate between Callendar and other climate science pioneers, including Hans Suess, Roger Revelle and Charles Keeling. Retrospective accounts of this episode tend to emphasize the scientists' theoretical and empirical claims that appear to anticipate contemporary consensus views regarding climate change. In contrast, I argue that the debate was essentially methodological and preliminary in character. The reason was that there was a gap between the boldness of Callendar's claims and the means available for evaluating them. In general, theoretical and empirical claims can far outstrip the means available for evaluating them. Especially in early-stage science, this lag can lead to garden paths of research. I argue that this case illustrates one way of avoiding this: scientists can condition the generation and acceptance of theoretical and empirical claims on two factors: what they know about the target system, and the nature of their epistemic relationship to it. These ontic and reflexive

conditions can be stated as norms of inquiry, rules scientists should follow to achieve the aim of the research in light of the conditions under which they work.

World III World: Global Modelling and the Global South ***Markus Elias Ramsauer, University of Vienna***

The 1972 publication of The Limits to Growth initiated by the industrialist think-tank Club of Rome has become widely remembered as a landmark in 20th century environmental history. Based on the output of the computer simulation model WORLD III, the report indicated that current trends in population growth and industrialization would lead to a collapse of the world system in the near future. Two lesser-known aspects of the publication are particularly significant. First, the report faced strong criticism —especially from advocates and representatives of the Global South—who depicted the WORLD model as an instrument of neo-colonial imperialism. Second, the report helped spark the development of follow-up models and gave rise to the field of "Global Modelling" as a distinct scientific discipline. This paper brings these two strands together by tracing how "Global Modelling" emerged in the 1970s as a way to explore new North–South relationships under the guise of neutral scientific inquiry. Combining approaches from the study of science formation with critical development studies and the lens of political epistemology, three global models are analyzed, focusing on controversies around population, temporality, aggregation, and the question, who can speak for the globe. Since the "global models" of the 1970s are now widely conceived as setting the stage for later Integrated Assessment Models —one of the main instruments for assessing global climate change— revisiting these origins with a focus on their relation to the "Third World" opens up connections to ongoing debates about climatic and environmental justice.

From 'Policy for Science' to 'Science for Policy': The Villach 1985 Conference and the Scientists' Political Shift on Climate Change ***Carolina Granado-Torres, Universitat Autonoma de Barcelona***

The 1985 Villach Conference marked a critical turning point in the politicisation of climate change, yet it remains surprisingly underexplored in the historiography of science. This paper examines how this pivotal meeting influenced the science-policy interface during the early stages of international climate governance. The central argument of my paper is that the Villach Conference provided climate scientists with a significant role in political debates on climate change. Previously, scientists' role in assessments was primarily confined to determining whether knowledge was sufficiently certain to warrant political action. At Villach, however, scientists adopted a more active role, advocating for political action. Moreover, this paper will show that discourses emerging from the conference challenged the conventional linear model—in which scientists merely provide knowledge for policymakers to act upon—by advocating for a more dynamic and collaborative relationship. The conference's recommendations, including stronger collaboration between scientists and policymakers and regular climate assessments, laid the groundwork for key assessment institutions such as the Advisory Group on Greenhouse Gases (1986–1990) and the still-existing Intergovernmental Panel on Climate Change (1986-). By doing so, Villach redefined the interplay between science and politics in global climate governance. Villach's legacy lies in its dual contribution: reshaping the scientific community's approach to advocacy and positioning climate change as a global political priority. This case study underscores the importance of historicising the early stages of global climate governance and highlights the transformative role of scientific conferences in triggering international policy responses.

When Critique Runs Out of Steam, We Can

Restart It on Renewables *Cathy Gere, History*

Bruno Latour's famous 2004 article "Why Has Critique Run Out of Steam?" observed that Science Studies scholars had woken up in the new millennium to find themselves in bed with climate deniers and rightwing conspiracy theorists. In the light of this painful irony, he suggested we rethink our whole strategy. This paper starts from the premise that running out of steam is good! Too many industrial energy systems still combust fossil fuels to make steam to spin turbines. By metaphorically converting Latourian critique to locally-sourced, intermittent rhythms of wind, water and sun, we can restart it for a warming world. Although Latour turned his attention to the environmental crisis only in the last phase of his extraordinary career, I take inspiration from his early work, rereading Science in Action and The Pasteurization of France as primers of eco-subversion at a hyper-local level. His target in those books, in an age of scientific ascendancy, was the sacred status of capital-T Truth. Using the case study of institutional decarbonization campaigns at the University of California, I redeploy his analytical armaments against the forces of ecological degradation, arguing that his insights into the making of scientific knowledge are even better applied to the transformation of industrial infrastructures.

087. Eugenics and the "Normal" in the U.S., 1910s-1950s

Organized Session

9:00 to 10:30 am - Saturday 15 Nov.

Sheraton New Orleans: Floor 3rd Floor - Napoleon C

The rise of eugenics and development of the concept of the "normal" in statistical, psychological, and other terms occurred simultaneously and informed understanding of human potential and societal ideals in the first half of the twentieth century. The idea of "productive normality," which connects individual happiness, ability, health, and heredity to social well-being was central to the broader goal of constructing a normative vision of human existence. This panel examines the history of the construction of the normal in eugenics and the sciences and practices shaped by these eugenic ideas of normality. How did eugenic theories intersect with statistical norms of the human body and mind in the first half of the twentieth century? How was the concept of "normality" constructed, applied, and challenged in the first half of the twentieth century, especially in relation to race, gender, psychology, and child development? How were these definitions used to justify exclusion and reinforce racial hierarchies? Panelists explore eugenic psychologists who closely linked happiness, genetic superiority, and social harmony in longitudinal studies of gifted children; examine eugenics practices that extended into child psychology, where assessments of children's art aimed to measure deviation from a racialized norm; argue that eugenic ideals justified excluding Black children from early studies that defined U.S. developmental standards by favoring only "optimal" subjects; and show how Black scholars used racial science to affirm Black humanity and challenge dehumanizing stereotypes. This legacy of eugenics continues to inform current debates over genetic intervention and the desire to optimize human capabilities.

Participants:

Painting the Eugenic Norm: Disabling Children through Art in the United States, 1920s-1950s *Isidro González, Claremont McKenna College*

By the end of the 1920s, eugenic field workers, most of them female investigators tasked with collecting the hereditary histories of the nation's masses, had lost much of the credence and respect among the scientific and social scientific professions within the United States. By the early 1930s, the US' foremost eugenic data collection agency, the Eugenics Record Office, had also seen its last days. Yet even in the 1940s when eugenics itself became a dirty word associated with the Third Reich, US eugenicists continued the project of categorizing human worth along various axes. As is well known, among eugenic solutions were intelligence tests

that not only became a standard of assessing students' worth and abilities but also grew exponentially in popularity in subsequent decades. Psychology itself too was undergoing mounting accusations of being unscientific. Scientists of the mind thus turned increasingly to a more observable behavioral psychology that drew from theories of genetics and animal behavior that was, in practice, more amenable to experimentation. Anthropomorphization notwithstanding, behaviorism paved the way for human-centered observation. One of these key tools for getting at the "microscopic peculiarities" of the mind was through children's drawings and paintings. Following the professional lives of two eugenic field workers over the period of roughly 30 years, I argue that dropping the "eugenic" qualifier from their titles did little to change the ideas, approaches, and objectives of eugenics. Not only that, but their work also became foundational in legitimizing the field of childhood psychology as a whole.

'The Totality of Happiness': Eugenics, Heredity, and the Measurement of Well-Being in the United States, 1910s-1950s ***Sandra Eder, Univ. of California, Berkeley***

Historians have extensively examined the evolving conceptions of happiness, arguing that it is not solely an individual pursuit but is deeply intertwined with social structures and cultural norms. However, less attention has been given to how the concept of happiness has historically been used to establish measurements of the "normal" that obscure systemic inequalities and injustices, or to justify controversial scientific studies and medical treatments. Eugenicists in the early twentieth century claimed that happiness, genetic superiority, and social harmony were closely linked. California eugenicist Paul Popenoe asserted in 1918 that a "eugenically superior or desirable person" would possess the genetic traits necessary to live to maturity, reproduce, experience happiness, and contribute to society's progress. In Applied Eugenics (1924), he argued that only eugenics could guarantee the "totality of happiness of all sentient beings or of all men." Similarly, Lewis Terman, Stanford psychologist and eugenicist, incorporated happiness as a key indicator of normality and productivity into his longitudinal studies of gifted children (1920). I argue that eugenics promoted an ideal of happiness and social harmony through genetic measures, using scientific methods to link hereditary traits and personality to societal well-being. By drawing on eugenic writings of the first half of the twentieth century and Terman's longitudinal studies of the gifted, I draw attention to the promotion of happiness as a eugenic tool and its lasting legacy in the conceptualization of the normal.

Development's Racial Properties: Eugenic Sympathies and the Self-Evidence of Black Exclusion at the Iowa Child Welfare Research Station, 1910 - 1930s ***Kelsey E. Henry, Princeton University***

In a 1916 press release titled "A Child Welfare Research Station," Carl Seashore, head of the Psychology department at the University of Iowa, professed: "One of the surprising developments in the recent baby contest movement is the finding that nobody knows what constitutes a normal physical child." However, upon founding the Iowa Child Welfare Research Station, Seashore and his contemporaries behaved as if they already knew. The first research site devoted to studying and engineering the "normal child," the Station exclusively enrolled white, non-immigrant, and middle-class children in its foundational studies of human development. This paper explores how eugenic sympathies, namely the desire to "progressively norm" developmental data by pre-selecting "optimal" research subjects, naturalized the exclusion of Black children from the inaugural studies that generated developmental metrics and standards for America's children. To do so, I apply science and technology studies frameworks of "agnotology" - the study of deliberate or manufactured ignorance - to

interrogate the racialized self-evidence that conditioned researchers' uninterrogated beliefs about which bodies could yield developmental norms. This paper also interrogates how a search for exacting experimental protocols and defenses of scientific rigor in child development science provided the most innocent alibi for upholding the racial parameters of the field. Ultimately, I argue that desires to eliminate "contaminating variables" in child development research naturalized raced and classed restrictions among child research participants and enshrined the white child body as the developing body in child development science.

Black Racial Science and The Human ***Ayah Nuriddin, Yale University***

During the late nineteenth century and much of the first half of the twentieth century, Black physicians, social scientists, and scientists were invested in using the ideas and tools of eugenics and racial science to make claims about the equality and humanity of Black people. They asserted that they could use the objective and rigorous study of race as a biological category to demonstrate that claims of Black inferiority had no scientific or moral basis. In doing so, they hoped to undermine the scientific racism that fueled racial discrimination and extralegal violence. I describe these efforts as Black racial science, and I argue that one of its fundamental goals was to demonstrate that Black people were human in the same ways as white people and therefore normal. Proving the humanity of Black people, however, did not negate the ways that Black physicians, scientists, and social scientists understood race as a biological category. Black racial science sought to disentangle biological race from racism and mobilize the scientific study of race to undermine scientific justifications for racism. I argue that this is about demonstrating the humanity of Black people to advocate for racial equality at different moments.

Session Organizer:
Sandra Eder, Univ. of California, Berkeley
Chair:
Suzanne Winter, University of California, Berkeley

088. Exhibit Hall Day 2
9:00 to 5:00 pm - Saturday 15 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon D

089. New Approaches to Early Modern Science
Contributed Paper Session
9:00 to 10:30 am - Saturday 15 Nov.
Sheraton New Orleans: Floor 4th Floor - Nottoway
Participants:

Island of Light: The Growth of Artificial Illumination in Early Modern London ***Zackery Gostisha, University of Chicago***

In recent decades, social scientists have begun to examine how the presence (or absence) of artificial illumination shapes everyday life. Building on these studies, this paper traces how a major centralized network of artificial street lights, which was invented and constructed in late seventeenth and early eighteenth-century England, was imagined, justified, and constructed by its purveyors. By closely tracing the language deployed by proponents and opponents of street lighting, along with the social links between the investors in lighting companies and England's urban gentry, this paper argues that centralized lighting networks emerged in early modern Britain as a result of the financial revolution, an increasingly powerful locus of state and state-adjacent investors, and the parallel rise of a commonly accepted discourse of progress. From there, this research begins to outline where centralizing lighting networks were constructed in the City of London and its suburbs, when they were constructed, and by whom. I argue that it was no accident that artificially lighted streets became commonplace in late seventeenth-century Britain; the society taking shape during this period was well situated to embrace and make use of new lighting technologies. Artificial light, then, should be understood

as a factor of modernization which links to the specific world in which it is emanated and interpreted.

Printing Privileges and the Mapping of Knowledge Networks in Early Modern Europe ***Marius Buning, University of Olso***

From the sixteenth through the eighteenth centuries, European authorities used privileges to regulate the publication of printed texts and images. These privileges granted exclusive rights to produce and distribute specific works and are considered one of the building blocks of modern copyright law. Beyond their legal significance, however, privileges can also serve as valuable sources for the history of science. They were central tools through which states and institutions shaped the circulation of knowledge, defined the boundaries of expertise, and legitimized particular forms of authorship and authority. While high-profile cases - such as the privileges granted to Descartes or Tycho Brahe - are well known, they have often been studied in isolation. This paper takes a different approach by drawing on systematic, quantitative data from the ERC-funded project 'Before Copyright' to provide a comparative, cross-regional analysis of the distribution of privileges across disciplines and jurisdictions. This analysis reveals distinctive patterns in the circulation of legal, medical, and scientific knowledge under different regimes of control. Building on this analysis, the paper argues that printing privileges can offer a productive lens for examining the networks of exchange and the administrative logics that governed access to print. By tracing how institutions determined who could produce, disseminate, and control knowledge, it proposes a new framework for understanding the role of privileges in shaping early modern knowledge cultures.

Louis-Jean-Marie Daubenton, the Geometricization of Form in Animals and Minerals, and its Legacy at the Paris Museum ***Ann C Campbell, Indiana University Bloomington***

In the nineteenth century, Paris's Muséum national d'Histoire naturelle became a center for a style of natural history which focused on form: in zoology, through the work of Georges Cuvier and Étienne Geoffroy Saint-Hilaire, and mineralogy, through René Just Haüy. Despite their famous differences, Cuvier and Geoffroy pursued a newly formulated discipline of morphology which considered form and structure of the whole animal. Haüy, in a seemingly disparate pursuit, advocated for a seemingly new style of mineralogy which focused on structure through crystallography, which would become the standard in the field. In this paper I argue that the focus on form underlying natural history at the Paris museum in the nineteenth century is grounded in the work of Louis-Jean-Marie Daubenton, museum intendent, who reformed both animal anatomy and mineralogy in the eighteenth-century. Daubenton, who coauthored the Histoire Naturelle with the Comte de Buffon, providing the extensive and detailed anatomical sections for the project, took animal form as the basis for organizing specimens, and reformulated the study of comparative anatomy to one that understood each animal in its whole and each whole in relation to one another. Moreover, this new comparative anatomy was mathematical, relying on extensive tables of ratios of parts to arrive at a geometricized animal form. In his less explored mineralogical work, Daubenton takes a similar approach to classifying and identifying minerals which rejects the reductionist chemical approaches of his analytical mineralogist counterparts at the Académie des sciences in favor of a geometrical definition of each type to understand minerals in their whole form through crystallographic methods. Here I argue that Daubenton's mineralogical methods are grounded in his anatomical approach; preserve a commitment to form, holism, and geometricization; and that this coproduction of new approaches in both fields lays the groundwork for the legacy of form at the Paris museum in the following century.

090. New Oral Histories and Archives in the U.S. History of Science

Contributed Paper Session

9:00 to 10:30 am - Saturday 15 Nov.

Sheraton New Orleans: Floor 4th Floor - Oak Alley

Participants:

Gender in Scientific Disciplines: Oral History Interviewing in Postwar Atmospheric Science ***Frank Amico, Florida State University***

This paper explores the methodology of oral interviews for telling histories of postwar atmospheric science. Reading against the grain in previously conducted archival interviews and giving greater attention to gendered themes in conducting new oral histories yields unique insights into atmospheric scientists' daily lives, experiences, and broader developments in the field not evident in traditional written sources. These themes reflect attention to spatial design and mobility, community dynamics within institutions and professional affiliations, experiences of inclusion or exclusion, familial relationships, and experiences of tension throughout lives and careers. In looking at the field of atmospheric science, these interviews have yielded increased importance on geographies in shaping research community dynamics, the importance of key allies in promoting institutional and disciplinary equality, and clarity of the professional limitations of work-life balance in scientific careers. While numerous male figures in atmospheric science have provided invaluable oral history testimonies with the American Meteorological Society, National Center for Atmospheric Research, and the American Institute of Physics, female atmospheric scientists have been underrepresented in these interview collections. I have begun a project interviewing women in atmospheric science with a gendered focus. These interviews can be particularly valuable as marginalized figures are sometimes more attuned to social or cultural dynamics seen as normative, unnoticed, and specifically unacknowledged by prominent figures. With the inclusion of these stories, the oral archive becomes more balanced, especially as female activist scientists were at the forefront of transforming institutions during this period to become more socially conscious, inclusive and equitable.

Forging Collective Identity: The Emergence of Gay Scientist Groups in the United States, 1977-1984 ***K. Stawasz, Rutgers University***

In 1977, eleven people met in Chapel Hill, North Carolina, to form the first organization of gay scientists. Over the next decade, around twenty similar groups formed across the country, marking the emergence of a collective identity for gay and lesbian scientists. What did it mean to claim the identity of “gay scientist”? Since the publication of the first volume of Margaret Rossiter’s landmark Women Scientists in America over 40 years ago, historians have produced a robust body of research on women in science. Despite this, historians have yet to systematically analyze gay and lesbian scientists and historicize the current struggles they experience. My project begins to forge a history of gay and lesbian scientists in the United States by examining the formation of gay scientist groups in the late 1970s and early 1980s. Utilizing an audio recording of the first national gathering of gay scientists in 1980 and ephemera from multiple gay scientist groups, I argue that gay scientist groups mobilized cultural scripts about science to pursue equality in the workplace, seek acceptance from their colleagues, and claim belonging to the scientific community. They particularly framed homophobia as a threat to the values of science, such as objectivity and meritocracy. Overall, this paper considers how these cultural scripts functioned both as rhetorical strategies and means through which gay scientists articulated selfhood.

Proof in Prions: The Early Managerial Work of Stanley Prusiner ***Glenn Bugos, Moment***

LLC

In 1997, Stanley Prusiner of the University of California San Francisco earned a solo Nobel Prize in medicine for discovering that the cause of scrapie was the prion–a novel infectious agent that triggered misfolded and fatal proteins in animal and human brains. In the race to manufacture certainty around the prion, Prusiner built an informal and costly yet effective research operation that was multinational, single-minded, persistently publishing, abreast of new biochemical research tools, and fluent in experimental controls accepted across disciplinary divides. My presentation, inspired by the work of Rob Kohler, focuses on two aspects of Prusiner's under-explored accidental management. First, a skeletal narrative of Prusiner's major investments in people and proofs that punctuated his progress in the 1980s and 1990s: bioassays, a pure scrapie agent, cross-species transmission, resistance to virus inhibitors, a transgenic mouse model, an image of its folding, and a synthetic protein. Second, how this work was enabled by his early funding: three grants from the NIH, grants from two private philanthropies, and gifts from many small donors fearful of how dementia diminished their loved ones. The complementary variety and lengths of his funding gave Prusiner freedom for regular make-or-buy decisions: i.e., whether to do research work in-house or with a specialized collaborator. As disclosure, I am organizing Prusiner's archive, more than 700 boxes, as a contractor at UCSF, though I am not speaking for him or it.

091. GECC Welcome Room Day 3

9:00 to 5:00 pm
Sheraton New Orleans: Floor 3rd Floor - Poydras

092. Knowledge, Visions, and Power at the Intersections of Social Sciences and Technology

Organized Session
11:00 to 12:30 pm - Saturday 15 Nov.
Sheraton New Orleans: Floor 4th Floor - Bayside ABC

Control and information technology have historically supplied scientists, scholars, and intellectuals with new technical and conceptual tools to think about humans and societies. For instance, in the mid-twentieth century, control technology provided social sciences with metaphors and models to think about the world in terms of complex systems and describe it in formal languages (Heyck, 2015). This panel joins this scholarship to bring to light new disciplinary, national, and intellectual contexts of the intersections of social sciences and technology, as well as their contributions to knowledge-making and relations to power. Bethany Anderson makes visible a previously overlooked episode in the history of anthropology by examining how cybernetics informed the research of anthropologists Margaret Mead and Rhoda Métraux at Columbia University, providing them with new theoretical tools to study the Soviet Union, a spatially inaccessible country during the Cold War. Victor Seow and Ekaterina Babintseva focus on engineering psychology, another field of social sciences that hasn't yet gained sufficient attention from historians of science. Examining engineering psychology in Chinese and Soviet contexts respectively, these two papers excavate how distinct Chinese and Soviet socialist visions of modernity and the place of the human in the sociotechnical systems of the post-industrial world made productive contributions to human and engineering sciences in each country. Hunter Heyck offers as a new framework to think about the nexus of managerial science and technology in order to explore the cultural meanings of the ideas about expertise, world-order, knowledge, power, and environmental effect intrinsic to sociotechnical systems. Together, these papers offer novel ways to think about the tasks, goals, and meanings that emerge at the intersections of social sciences and technology, making a timely contribution to the public and scholarly understanding of technology's integration into the studies of society and making of social orders.

Participants:

Problems for the Computer Age: Soviet Industrial Psychology and Artificial Intelligence *Ekaterina Babintseva, Purdue University*

This presentation traces how a model of

human problem-solving developed by Soviet industrial psychologists was implemented in artificial intelligence research at the Moscow Institute of Physics and Technology. In the 1960s, the Council of Cybernetics at the Soviet Academy of Sciences played a crucial role in establishing the field of industrial psychology. Defining cybernetics as the science of control in large systems, its director, Aksel Berg, viewed psychology as a source of knowledge about cognitive mechanisms used by humans in the management of large systems such as factories, plants, and transportation hubs. In the 1960s and 1970s, Soviet psychologists affiliated with the council conducted a series of studies with transportation hub operators to determine how they solve problems when managing large systems. In the 1970s and the 1980s, their studies provided the guiding lines for research in artificial intelligence at the Moscow Institute of Physics and Technology (MIPT). Working on computer systems that controlled production in Soviet plants and factories, the MIPT group used this mundane task as a testing ground for finding new instruments of formalization in order to bridge the gap between human problem-solving and the computer. I situate this episode in Soviet industrial psychology and artificial intelligence research within the history of the USSR's mid-century efforts in computer automation. The concerns about Soviet economic growth and the ability of the Soviet socio-economic system to compete with the West shaped Soviet research in human and artificial intelligence.

Management and the Sublime of Design ***Hunter Heyck, University of Oklahoma***

In this talk I will advance five linked propositions about modernity and management. The first proposition is that there are sublimes of design that are related to but distinct from the more familiar sublimes of power. Put another way, there are sublimes of omniscience as well as of omnipotence. Second, these sublimes of design have a history, as sublimes of design have highlighted and valorized particular aspects of God, Nature, and humanity and so have been parts of different socio-technical imaginaries. Third, sublimes of design have appealed to, inspired, and legitimated the work of specific people, particularly those who design, manage, finance, and make policy for large, long-lived, integrated, insulated socio-technical systems. Fourth, these sublimes of design have been parts of changing visions of the socio-technical order writ large, as well as of the role of the manager and the expert in that order; in particular, they have been parts of visions that prioritized mobility and seamless, continuous flows within systems. Such visions also prioritized making the socio-technical order legible at ever more comprehensive levels. And fifth, while displays of power over nature have inspired anti-sublimes of toxic, desolate landscapes in recent decades, sublimes of design were reinvigorated by the advent of digital communications and computing technologies, especially by the internet, 'big data,' and AI, which helped counter an earlier anti-sublime of corporate sterility and bureaucratic stasis. More recently, however, the sublime of design increasingly has been countered by a new evil twin, an anti-sublime of viral corruption.

Socialist Workers as Sensory Subjects: Engineering Psychology in the People's Republic of China ***Victor Seow, Harvard University***

In this paper, I explore the emergence of engineering psychology in early 1960s China, tracing how Chinese psychologists, under the persistent demands of industrial development and rapid technological change, came to focus on the relationship between humans and machines. Rejecting the assumption that people would be gradually displaced from the labor process by accelerating automation—an assumption they associated with their counterparts in capitalist countries—these psychologists embraced instead the idea that any contradictions between human

and machine could be reconciled so as to improve efficiency, safety, and productivity. Through laboratory experiments and on-the-ground research, they sought to reconfigure visual and somatic environments to better minimize human error and optimize worker performance. Driven by a technopolitical vision in which the worker's body became both the medium and object of rationalization, they put forward a series of workplace reforms, from the recalibration of railway signals to the redesigning of power plant control rooms. I contend that such practices were not just pragmatic fixes to industrial problems but part of a socialist project to govern labor through the reordering of life that affirmed the centrality of workers' perceptual and sensory capacities in sustaining the larger human-machine assemblage.

'Towards a (Cybernetic) Human Science': Margaret Mead, Communication, and the Study of Culture at a Distance ***Bethany Anderson, University of Illinois Urbana-Champaign***

Communication theory was fundamental to both cybernetics and information theory during the postwar and Cold War years. Communication models were employed to describe different mechanisms, such as message replication across space or feedback loops. While much of the historiography on communication theory tends to situate it within histories of computing, engineering, media studies, and information theory (or vice versa), it also made its way into anthropology during the Cold War, and specifically into Margaret Mead's research projects. Using her projects of the Research in Contemporary Cultures (RCC) program at Columbia University as a point of departure, this paper explores the ways in which cybernetics and communications theory informed Mead's work during the Cold War. Inspired by her participation in the Macy Conferences on cybernetics (1946-1953) and the human-machine dialectic those meetings brought to the fore, these intellectual currents surfaced in the research agenda of the RCC and its successor projects. Through the RCC program, Mead and fellow anthropologist Rhoda Métraux developed interdisciplinary methods for "studying culture at a distance." Such methods were intended to support ethnographic engagement and understanding of cultures which were inaccessible due to either spatial or temporal barriers. Among the RCC's projects were those focused on China, Japan, and the Soviet Union. The Soviet Union in particular became a point of interest for Mead as a cross-cultural communication problem. Situating her work within a long trajectory of engagement with cybernetics, I argue that a cybernetic understanding of communication was important to Mead not only as a way to articulate a language of diplomacy and foster dialogue during the Cold War, but also as a way to re-conceptualize anthropological praxis.

Session Organizers:

Bethany Anderson, University of Illinois Urbana-Champaign

Ekaterina Babintseva, Purdue University

Chair:

Judith Kaplan, Science History Institute

093. Insects, People, and Alternative Histories of Entomology

Organized Session

11:00 to 12:30 pm - Saturday 15 Nov.

Sheraton New Orleans: Floor 3rd Floor - Borgne

When most people think about insects – if they think about them at all – probably consider them as annoyances or, worse, as creepy, crawly vectors of disease. Perhaps they have in mind charismatic microfauna such as pollinators whose diminishing numbers are portents of larger deleterious changes in our environment. But the common view is typically a dualistic one, as Lisa Onaga and Luísa Reis-Castro noted in their recent Isis article, which frames insects as either tools or targets. This HSS panel will explore beyond this binary with a quartet of case studies that present alternative histories of entomology. Our ensemble of papers is varied in terms of geographic and temporal coverage, ranging from medieval Europe and Tokugawa Japan to 18th

century England and Progressive-era United States. Underlying all four of these papers is a common focus on the study of insects, performed outside the confines of professional entomology, for legal, recreational, economic, and husbandry purposes.

Participants:

Of Pelage, Plumage, and Piscators: The Rise of a Streamside Science ***Patrick McCray, University of California, Santa Barbara***

In the 19th century, practitioners of the centuries-old craft of fly fishing began to interact with rapidly professionalizing community of entomologists. Many anglers, first in Great Britain and then in the United States, worked diligently to create artificial flies that closely mimicked the insects they observed in the natural world, drawing on knowledge drawn from professional scientists and their own streamside experiments. Other anglers rejected this practice, arguing that such detailed mimicry was unnecessary if not absurd. For devotees of what was often called “the gentle art,” how one angled mattered. Consequently, the “imitationists” and the “impressionists” fought a gracious decades-long battle on the banks of rivers and in the pages of books and sporting magazines. Anglers’ debates, c. 1840-1940, speak to many issues of interest for historians of science: trust; reliability; moral economies; materiality; labor and gender; pedagogy; knowledge circulation; the importance of place; and the valuation of personal experience versus detached observation. British and American anglers consumed and produced scientific knowledge albeit in the service of what many of their contemporaries saw as the impractical activity of trying to catch a fish using a bundle of feathers and fur that may (or may not) resemble a living insect. Put another way – anglers eagerly engaged with scientific knowledge to create fake insects even if the actual results sometimes proved capricious when cast into the current.

What to Feed the Bees? Identifying Honeybee Fodder in a Pre-Linnaean Agricultural Manual ***Nicole Archambeau, Colorado State University***

Ruralia commoda, Pier de Crescenzi’s agricultural manual (first published c. 1305), gave detailed insight into how people should care for their honeybees. In particular, Crescenzi observed bee health and sickness in relation to his native trees, shrubs, and flowers. According to Crescenzi, these plants did more than just keep the bees fed. Some plants, like thyme for example, improved bee health. Exactly how these plants improved bee health or even what these plants were is still a question. Ruralia commoda – a book widely translated and circulated for several hundred years – was not written for beginning beekeepers, and it assumed large amounts of knowledge on the part of the reader. The book was also written prior to the development of a Linnaean taxonomy. Therefore, the exact plants and their effects are difficult to distinguish. This paper will attempt to identify the plants Crescenzi refers to and consider the properties of those that he described as improving bee health. By studying an agricultural manual from medieval Europe, we can better understand how medieval European beekeepers cared for their honeybees, especially with plants that they actively included in their bees’ vicinity for fodder.

Gutsy Lines: Casting New Histories of Silk-Moth Cultivation ***Lisa Onaga, Max Planck Institute for the History of Science***

Fishing lines are normally manufactured to be virtually imperceptible underwater and strong enough to bear the force of fishes intent upon evading their capture. Dubbed “tegusu” テグス in Japanese, these transparent threads are largely made of nylon today. A closer look at the material history of tegusu shows that humans regularly transformed silkgut into tensile threads of specific thickness for fishing line classes. This presentation explores a curious link between “wild”silk cultivation and fishing in Japan by tracing the

formation of threads unraveled from the bright green cocoons of a tree-dwelling silk moth known as tensan 天蚕 (Antheraea yamamai). Long prized for their luxuriously lightweight silk, tensan moths are capable of flight and associated with a complicated free-range rearing method that requires basketry to prevent escape. The large tensan larvae feed on sawtooth oak tree leaves until they spin cocoons of ethereal green silk filaments called tegusu. Material practices outlined in Tokugawa and Meiji Japanese manuals show how humans separated these moths from their natural habitats. The technical conditions that settled into place may have encouraged the harvesting of other tree-dwelling moths (such as camphor silk moths), explaining why “tegusu” has become anchored to the world of fishing. In short, the histories of cultivating tree-dwelling silkmoths in Japan highlight how such insects were not valued only for their cocoons and silk to be cast onto spindles but also for their larval silkguts to be cast out into Japan’s archipelagic waters.

Whimsies and Maggots: Entomology, Madness, and Gender in Early-Eighteenth Century England ***Michele Pflug, University of Oregon***

At the turn of the eighteenth century, many onlookers regarded the study of insects with distaste at best and suspicion at worst. Naturalists often complained how their neighbors thought them mad for prodding feces for worms or chasing butterflies across meadows. Although the trope of the eccentric insect collector recurs across letters, manuscripts, and satirical works, the topic remains underexplored in scholarship on early entomology. This paper draws on the sensational trial record of Ashfield v. Goodricke (1709) to contextualize accusations of madness made against England’s earliest known woman lepidopterologist, Eleanor Glanville (1655-1709). Glanville’s family and neighbors described her as a woman subject to “whimsies” and “maggots,” two words that became synonymous with one another during this period. While maggots denoted a kind of insect, the term also came to signify a whimsical and “freakish” person, the implication being that his or her brain had decayed into madness and sprouted maggots. Yet, as previous scholars have demonstrated, the playfulness of whimsy and fanciful reasoning contributed to the development of early modern experimentalism. Glanville’s experience and those of her male counterparts illustrates the social consequences when whimsies and maggots came to be understood as madness.

Session Organizer:
Patrick McCray

Chair:
Alexandra Hui, Mississippi State University

094. New Books in the Global History of Science

Authors Roundtable
11:00 to 12:30 pm - Saturday 15 Nov.
Sheraton New Orleans: Edgewood

Participants:

Connected Cartographies: World Geography and the Sino-Western Translation of Knowledge, 1580-1842 ***Florin-Stefan Morar, National University of Singapore***

In the 'Age of Discovery', explorers brought a wealth of information about new and strange lands from across the oceans. Yet, even as the Americas appeared on new world maps, China remained a cartographic mystery. How was the puzzle of China's geography unravelled? Connected Cartographies demonstrates that knowledge about China was generated differently, not through exploration but through a fascinating bi-directional cross-cultural exchange of knowledge. This book shows that interactions between Chinese and Western cartographic traditions led to the creation of a new genre of maps that incorporated features from both. This genre included works by renowned cartographers such as Abraham Ortelius and Matteo Ricci and other less-known works, 'black tulips of

cartography,' hidden in special collections. Connected Cartographies draws from original sources in multiple languages from archives across three continents, producing a pioneering reconstruction of Sino-Western cartographic exchanges that shaped the modern world map and our shared global perspective.

Creatures of Reason: John Herschel and the Invention of Science ***Stephen Case, Olivet Nazarene University***

In November 2024, I published my second monograph, Creatures of Reason: John Herschel and the Invention of Science (University of Pittsburgh Press). This book explores the early self-fashioning of Herschel, son of the famous astronomer William Herschel, as he initiated a mathematical reform in Cambridge and rose to prominence within the scientific community, ultimately failing in a reforming bid for presidency of the Royal Society. Based on journals and correspondence, this biographical study culminates in the 1833 publication of Herschel's Preliminary Discourse on the Study of Natural Philosophy, which, I argue, set much of the tone for modern science in Britain and was highly influential among the first generation of scientists. Herschel's life straddles the transition from natural philosophy to modern science, and Creatures of Reason shows the ways in which Herschel established himself as the most important scientific voice during this period. For this roundtable discussion, I can discuss the challenges of a biographical approach to the history of science, especially for someone whose work was as wide-ranging as Herschel's: covering astronomy, mathematics, physics, optics, and chemistry.

Soviet SCI_BERIA: The Politics of Expertise and the Novosibirsk Scientific Center ***Ksenia Tatarchenko, JHU***

At first glance, the Novosibirsk Scientific Center, or Akademgorodok, appears as an outlier in academic excellence. This 'science city' is renowned for a preeminent university, dozens of research institutes, and a thriving technopark. At home, it is an emblem of Russian innovation; abroad, it is often portrayed as a potential threat, a breeding ground of cyber soldiers. Though Siberia has been the main source of post-1991 Russian carbon revenues, its soviet history and cold war legacy of internationalism demonstrates that territorial and scientific dimensions interlocked the moment the Siberian Branch of the Soviet Academy of Sciences was created in 1957. Drawing on a wide range of previously unexplored archives, Soviet SCI_BERIA focuses on how the post-Stalinist Siberia was redefined and represented through the ideal of rational development, the late socialist innovation practices, and the relationship between experts and the state. It offers a fresh insight into the transition from Soviet to post-Soviet Akademgorodok. In doing so, Tatarchenko not only fosters a conversation between history, area studies, and science studies but also sheds new light on Soviet modernity and the limits of its transformative projects.

Vida Zoo-cial: The Buenos Aires Zoo and the Making of Argentine Society, 1875-1924 ***Ashley Elizabeth Kerr, University of Idaho***

At the beginning of the twentieth century, the Buenos Aires Zoo was one of the most visited zoos in the world, and its animal inhabitants appeared constantly in magazines, newspapers, short stories, and more. In 2022, I was granted access to two rooms on the grounds packed with dusty boxes containing a jumble of copy books, journals, photographs, and receipts dating from the 1870s until the 1980s. As Patagonian maras wandered by outside, I crafted my monograph, Vida Zoo-cial: The Buenos Aires Zoo and the Making of Argentine Society, 1875-1924 (Vanderbilt UP, fall 2025). In it, I argue that city elites used the Zoo and its animals to address social concerns and shape residents—especially immigrants, women, and the poor—into ideal members of the nation. Ultimately, although these projects aimed to improve the lives of all city

residents, they were quite conservative, supporting only superficial reforms while reaffirming established power structures. The first book-length monograph in English about a Latin American zoo, Vida Zoo-cial enriches understandings of a conflictive period of Argentine history and advances an alternative, non-imperial model for understanding the functions of zoos. Finally, although the Buenos Aires Zoo and its animals were enticing tools for addressing turn-of-the-century social concerns, their reception and effectiveness was highly variable. Vida Zoo-cial thus alternates chapters detailing efforts to shape society with Interludes that demonstrate how humans and non-human animals challenged, resisted, or appropriated elites' projects for their own purposes. In this roundtable participation, I will discuss the experience of working in a rich but un-inventoried archive, what Latin American zoo histories can add to global discussions of zoos and similar animal establishments, and my efforts to recuperate the experiences of zoogoers and zoo animals despite their limited archival presence.

095. Transness, Autism, and the Social Histories of Diagnosis

Organized Session

11:00 to 12:30 pm - Saturday 15 Nov.
Sheraton New Orleans: Napoleon A1

In recent years, a growing body of scholarship has demonstrated the historical and contemporary entanglement of transness and autism as objects of scientific-medical discourse. From the shared roots of contemporary "treatment" paradigms in mid-century behavioral psychology (See: Gibson and Douglas) to the centrality of dehumanization in clinical and diagnostic literature (See: Pyne, Yergeau), autism and transness have occupied similar positions of scientific-medical scrutiny, medical-ethical debate, and cultural-political fixation. In this panel, scholars working at the intersection of trans and critical autism studies highlight points of convergence in the scientific-diagnostic histories of these respective categories of difference, tracing how each has served as both conduit and figurehead for broader cultural anxieties around gender, personhood, and medical authority. Works Cited Gibson, Margaret F. and Patty Douglas. 2018. "Disturbing Behaviors: Ole Lovaas and the Queer History of Autism Science," Catalyst 4(2):1-28 Pyne, Jake. 2020. "'Building a Person': Legal and Clinical Personhood of Trans and Autistic Children in Ontario," Canadian Journal of Law and Society 35(2):341-365. Yergeau, Remi. 2019. Authoring Autism: On Rhetoric and Neurological Queerness. (Durham: Duke University Press)

Participants:

Sticky Genders: On Neurodivergence and the Rhetoric of Fixation *M. Remi Yergeau, Carleton University*

This presentation examines how rhetorics of fixation structure popular understandings of transgender identity. Fixation, I argue, serves as a kairology for anti-trans researchers. Drawing from Jack et al's (2017) contention that a kairology functions as a "map of opportunity," I contend that contemporary anti-trans media leverage obsessional conditions such as autism and OCD as a means of claiming ground in (un)diagnosing transness. Rather than conducting a history of trans obsession, this talk offers a rhetorical analysis of ritualistic figures and the timing of their appeals. Kairology, as Segal (2008) notes, highlights how "things are persuasive when they are fit to situations" (p. 23). Moving between mid-20th century medical literature on compulsive transvestism alongside contemporary discourse on rapid onset-gender dysphoria (ROGD), I explore recurring linkages between obsessionalism and gender expansiveness. Fixation serves as a powerful commonplace within anti-trans lore, providing rhetorical means for explaining both trans persistence (gender durability) and trans desistance (gender malleability) (Safer et al., 2016). Trans medicine has long been notable for its desire to authenticate true transhood as that which is static and always-known (shuster, 2021) versus that which is figured as newly emergent or fleeting. And yet, I

argue that the contemporary anti-trans fixation with fixation effects its power by claiming any expression of gender nonconformity, no matter how un/fixed, is powered by technologically-mediated perseveration. In other words, the kairos of networked technologies enables anti-trans rhetors to refashion the clinical gatekeeping of old as a social media-driven obsession with gender.

Dubious Memoir: The Case Report as the Clinician's Autobiography ***Jake Pyne, York University***

The methodology of storytelling in research is often drawn upon as a technique for surfacing embodied knowledge, and often theorized (though not without critique) as a positive mode of empowerment. Yet historians also chronicle how social violence travels on the popular story, suggesting that those political ideologies delivered to our consciousness vis-a-vis story, might be absorbed more readily and more deeply than if formally taught. Within trans studies and critical disability studies, an analysis of the function of narrative is longstanding, while critical autism studies has explored how the story-features of autism science work to produce the tragic autistic figure. In some cases, Remi Yergeau's work in particular, scholars have considered what the so-called autism expert is trying to say about themselves. Given that autistic trans people find themselves in the clinical pages of both the autism specialist and the gender identity clinician, this paper builds on Ann Fudge Schormans' proposal that we might read the case report as the clinician's autobiography. Examining the elements of setting, plot, character, and story arc, I treat both the autism expert and the gender expert as dubious memoirists and engage with the clinical case report – the clinic-borne story - as a tale the clinician tells to and about themselves, as an attempt at making oneself into what Sunera Thobani calls an "exalted subjects"- a grander self.

Challenging Diagnostic Non-Personhood in Trans and Autistic Self-Advocacy: Historical Resonances ***Cam Cannon, The George Washington University***

In recent years, a number of scholars have traced how mainstream trans advocacy in the U.S. has asserted trans personhood through a repudiation of sickness, disability, and divergence, including autism. In this paper, I highlight alternative visions of transness that proliferated prior to the consolidation of an ableist and medicalized notion of trans personhood as the primary tactic of trans political advancement in the U.S., arguing that the priorities of such movements resonate with those of much contemporary autistic self-advocacy work. Specifically, I argue that this understudied strain of trans activism viewed the restriction of gender-affirming care technologies as part of a broader carceral network that restricted the autonomy and mobility of individuals classed into various diagnostic categories, including but not limited to transsexuality, schizophrenia, and autism. This intellectual and political tradition of trans thought was concerned with not only the university gender clinic, but also many of the same institutions scrutinized by contemporary critical autism studies: the hospital, the school, and the psychiatric detention center. This strain of trans thought, I argue, put forth a critical reading of medical science that not only rejected the displacement of non-personhood undertaken by other trans-led movements of the time, but rejected the legitimacy of the same medical establishment from which other trans organizations sought legitimization. I place this intellectual history in conversation with contemporary autistic self-advocacy not only to point out their philosophical resonance, but to consider how the marginalization and historical obfuscation of this tradition can inform contemporary understandings of medical activism, scientific personhood, and institutional critique.

Aphasia Against Metaphor: Ernest Jones, Ruth Levin, and the Historical Somaticism of Early Autism Diagnoses ***Steacy Jane Easton***

Ernest Jones, the psychoanalyst, would eventually become prominent enough to write Freud's authorized biography. The eventual prominence would allow himself to hide abuse he committed in his early years–including a possible sexual interference of minor patients, in 1906 and 1908. Ruth Levin, one of these patients, was aphasic, and was diagnosed with Dementia Precortex, a precursor to a contemporary diagnosis of Autism. When Jones eventually talked about these charges, and this aphasic patient, in a 1955 memoir, he claimed that his interest in psychoanalysis led to a moral panic, that his interest in aphasia was in concordance with early interest in Freud. However, Jones' early interest in aphasia, was not psychoanalytic, but an interest in the organic bodies. He worked with the neurologist Kraepelin–whose medical understanding was somatic in ways that Freudian work was not necessarily. He would, in his early years of residency, examine hundreds of skulls, both of living patients and cadavers. There is an element of taking Levin's voice away from her, for the literature to be about Jones and not to be about Levin; and this is made especially ironic with aphasia's connections to the history of gender and madness. Jones had no interest in letting the aphasic communicate in an effective manner, and used his history of medicine to clean up a complex, and perhaps criminal history–aphasia then becomes a metaphor for a gendered understanding of Autism, a historical example of silence and clinical intervention as harm.

Session Organizer:

Cam Cannon, The George Washington University

Chair:

Cam Cannon, The George Washington University

096. Then and Now The Enduring Allure of Genetic Determinism

Organized Session

11:00 to 12:30 pm - Saturday 15 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon A2

Western science has been driven by the belief that we can control, manipulate and improve nature. This session explores the idea of a genetic fix to address societal issues and how awareness of the past is relevant to social justice issues today. Tabery discusses a century's worth of state-level legislation, showing how the rationale for sterilizing people with disabilities evolved over time. While the contemporary practice is distinct from the sterilization programs of the eugenics era, in other ways it continues to share similarities to the past. Lyons draws parallels between phrenology and current research in behavioral genetics as applied to the justice system. The fundamental ideas of phrenology still guide much current research. Phrenology represented a science of possibility and improvement, as does current genetic research. Its multifaceted history sheds light on why biological explanations are so popular beyond the critiques of perpetuating various discriminatory agendas. Genetics has made its way into the courtroom, but the complexity of the findings makes the role it plays in legal proceedings problematic. Allchin's discussion of Charles Davenport's early 20th-century use of pedigrees as "evidence" for the biological inheritance of pellagra, feeble-mindedness and E.O. Wilson's broad support in the 1970s and 80s for a sociobiological interpretation of eusociality illustrates the rhetorical appeal of biological determinism and also as examples of error in science. He uses them to examine the conditions when science has proven trustworthy, and when it has not, which provides important insights for citizen-consumers in contextualizing and interpreting scientific claims

Participants:

Unfit to Reproduce, Unfit to Parent, Unfit to Decide: The Evolving Rationale for Sterilizing People with Disabilities without Their Consent ***James Tabery, University of Utah***

Dozens of states controversially allow for

non-consensually sterilizing people with disabilities. For critics, a practice that removes certain people's ability to decide whether to have children harkens back to eugenics and the targeting of people with disabilities as "unfit." For defenders, there's a clear difference between the past eugenic sterilizations and the sterilizations of the present; they proceed now only through an independent review process charged with confirming that a sterilization will be in the patient's best interest, and such process is triggered by a parent/guardian, not a state actor. We draw on a century's worth of state-level legislation to reveal how the rationale for sterilizing people with disabilities evolved over time. What began as an explicitly eugenic practice designed to target those who were deemed "unfit to reproduce" morphed into one aimed at preventing those who were deemed "unfit to parent" from having children they couldn't raise, and then transitioned again to allow for sterilizing people who were deemed "unfit to decide" for themselves. The history reveals some ways that the contemporary practice is distinct from the sterilization programs of the eugenics era, but also other ways that the sterilizations performed today inherited and continue to share similarities to the past. As more states reckon with their histories of eugenic sterilization by issuing apologies and funding compensation programs for sterilization survivors, getting clear about the historical relationship between the abhorrent past and the controversial present is essential.

Genes and the Justice System: Lessons from Phrenology ***Sherrie I Lyons, Independent Scholar***

This is part of a project that examines the idea of a technological fix- specifically a genetic fix in the history of science and technology. Behavioral genetics may seem to have nothing in common with phrenology, but there are many striking similarities. Phrenology is regarded as pseudo-scientific; yet how different are the claims of genes for criminality, aggressiveness, and impulsivity from the phrenologist's claim that distinct organs in the brain were responsible for traits such as aggressiveness, shiftlessness, or destructiveness? Francis Gall's functional approach that claimed anatomical and physiological characteristics directly influence mental behavior continues to be the basis for present day research on mind and brain. Phrenology also made claims based on questionable and biased experimental evidence. Some present day research will be discussed and its role in legal proceedings. Phrenology implied that some people were born criminals due to the particular biological structure of their brains. Phrenology also sheds lights on the paradoxical aspect of why biological explanations have been so attractive. George Combe's ideas for prison reform based on phrenological principles resonated with Victorians' belief in science and progress. Many if not most behavioral geneticists are motivated by the same beliefs as Combe. Phrenology is a reminder that the claims surrounding behavior genetic research need to be met with a degree of caution before they are admitted into court as evidence. It's dual legacy can be seen in present-day biological research on behavior wrapping itself in the language of the scientific authority of genetics.

The Historian & the Misinformed Science Consumer: The Cases of Charles Davenport and E.O. Wilson ***Douglas Allchin***

This presentation addresses professional scholarly roles and responsibilities. In recent years, we have witnessed widespread scientific misinformation in the media. Indeed, historical lessons may be an important tool in educating citizen-consumers today, helping them learn how to contextualize and interpret the trustworthiness of appeals to scientific claims. For historians, such misrepresentations of science are hardly new. Claims not endorsed by a scientific consensus have been widely accepted as reliable science. Here, I briefly

summarize two sample lessons from the history of genetics, illustrating the enduring rhetorical allure of biological determinism, its flaws, and the telltale architecture of the Naturalizing Error. The first case is Charles Davenport's early 20th-century use of pedigrees as "evidence" for the biological inheritance of pellagra, feeble-mindedness, and other conditions we would now easily attribute to social class inequities. The second case is E.O. Wilson's broad support in the 1970s and 80s for a sociobiological interpretation of eusociality, or cooperative breeding species. Presented in high-profile popular publications, they seemed to support the cultural ideology of "family values" and to justify racist-style reasoning as reflecting "natural" (and thus uncontestable) principles. Recently, many scholars have re-envisioned the nature of scholarship to include the ethical responsibilities of promoting social justice. Even if this view is overstated, professional historians of science, as stewards of cultural knowledge, are uniquely situated to clarify how awareness of the past is relevant to mediating the role of science in social justice today.

Session Organizer:
Sherrie I Lyons, Independent Scholar

Chair:
Sherrie I Lyons, Independent Scholar

097. Engendering Health in the Americas

Contributed Paper Session
11:00 to 12:30 pm - Saturday 15 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon A3

Participants:

"An Effort for Women to Help Women": Medical Women and the Founding of the Pacific Dispensary Hospital for Women and Children of San Francisco, California, 1876 ***Suzanne Winter, University of California, Berkeley***

Women's collectives during the first women's rights movement (1848-1920) imagined and incorporated hospital solutions for healthcare crises in their cities. Hospital incorporation defined a new kind of body politic by expanding the corporate franchise to self-identified medical women. The act of incorporation manifested women's groups as corporate collectives imbued with legitimate existence and rights. As a body politic, hospital women voted on how to direct the flow of hospital funding in support of their missions. As an embodiment of women's politics, hospital corporations reshaped the local healthcare environment, institutionalizing gendered caregiving aims through their professional mandates. This paper focuses on the medical women of San Francisco in the Reconstruction Era, and their fight "to provide for women the medical aid of competent female physicians, and to assist in educating women." In 1876, women physicians in California were discriminated against at the county and state level as licensing societies denied them entry. Undeterred, women physicians and activists incorporated a separatist hospital. They hired an all-woman attending staff to educate medical women while addressing gaps in preexisting women's medical and surgical services. Through the legitimacy that incorporation gave to their hospital, women physicians were found suitable for state license. San Franciscan women physicians achieved individual professional emancipation through the corporate franchise. Yet they learned of the brittleness of corporate democracy when a new Board of Managers was elected in response to changes in feminist healthcare politics. Incorporation embodied, and reincorporation voided, the women physician's hospital mission of professional emancipation.

Creating Space for Science in Allied Health: Gender and Power in Late-Twentieth Century American Universities ***Andrew J Hogan, Creighton University***

Allied health is perhaps best defined by what it is not. The term "allied health" has long been used as a catch-all for fields other than medicine, dentistry, and nursing. Even though allied health workers comprise the majority of America's health

workforce, historians have largely overlooked this sector. During the 1950 and 60s, as these predominantly female fields, including physical therapy and medical technology, moved their training programs from hospitals to universities, the male hierarchies in colleges of medicine and arts & sciences marginalized them. The landscape for allied health began to change in the late 1960s however, with an influx of targeted federal dollars. Universities used this money to open separate allied health colleges, which provided these fields with space and autonomy to build their own science and identity. This presentation draws on archival sources from the US government and several universities to explore the intertwined legislative and academic origins of allied health. The creation of separate allied health colleges moved these primarily female fields from the control of male dominated hierarchies in medical and arts & sciences colleges, to oversight by a newly formulated, outsider, and still predominantly male cohort of leaders, who had their own ambitions for allied health. This paper builds on the scholarship of historians including Dominique Tobbell and Daniel M. Fox, on late-twentieth century health sciences workforce development. Leaders in allied health fields like physical therapy lamented and resisted the oversight of male allied health college deans, who often had backgrounds in psychology or medicine. I argue that, even with these misgivings, the institutional and financial independence facilitated by allied health colleges, and federal support of them, provided the space the resources necessary for these fields to develop robust scientific identities, and ultimately thrive by the 2000s, in the US academic landscape.

Promotoras: Female Healthcare Volunteers in Guatemala's Hinterlands, 1975-1985 ***Aaya Kingsbury***

This paper—based on archival research conducted at the Centro de Investigaciones Regionales de Mesoamérica (CIRMA) in Antigua, Guatemala—examines the role of promotores/promotoras (health care workers and volunteers) during Guatemala's internal conflict. This project forms part of my dissertation research on public health during this time. Promotores and promotoras experienced varied responses to their presence in indigenous communities, this project discusses the reasons for these responses including fear, distrust, and overall confusion as to the utility of health care volunteers. A key aspect of their work included vaccinations and education regarding hygiene. Through the use of newspaper clippings, interviews with former promotores, and other materials accessed in the archive this paper places promotores at the center of health and health care in a time of crisis and fear—recognizing the commitment and sacrifice promotores made in order to reach marginalized and isolated communities. This paper examines specifically the role of female promotoras and female health care providers in the context of resistance, activism, and health education.

098. GECC Lightning Talks

Organized Session

11:00 to 12:30 pm - Saturday 15 Nov.
Sheraton New Orleans: Napoleon B1

This lightning talk panel organized by the Graduate & Early Career Caucus provides a venue for graduate students and early career scholars to share focused presentations on work in progress. Presenters are encouraged to explore emerging arguments from ongoing research, initial findings from side projects or archival investigations, pedagogical challenges, or reflections grounded in field experience. The panel aims to foster a collegial and supportive environment for developing ideas, receiving feedback, and building community across career stages.

Participants:

A Technology History of Hearing Aids in Republican and Socialist China ***Shu Wan***

As an assistive technology in treating hearing impairment, the development of hearing aids has significantly shaped the

perception of deafness. However, the trajectory of this technology in modern China has yet to be well studied. This paper explores the forgotten history in the following three phases: the introduction of hearing aids as Western knowledge, their import as new technology, and their production in a Chinese factory. As early as the 1930s, the development of hearing aids was introduced as a modern miracle in the Chinese press. In the following two decades, both Western corporations and the communist government imported hearing aids and provided them to Chinese deaf people. Parallel to the advance of industrialization in socialist China, its first hearing aids factory was established in 1960. Through the lens of the trajectory of hearing aids in mid-20th century China, this essay contends for the significance of the materialist aspect of Chinese deaf and Disability.

Eating Plankton: Extracting Sustenance from the "Floating Pasturage" of the Sea (1930s-1950s) ***Zi Yun Huang, University of Chicago***

From the 1930s-1950s, British and US scientists and military personnel made various efforts to extract plankton (marine micro-organisms) from the oceans as a form of sustenance. My talk examines the history of how plankton were envisioned as a food source, initially as an emergency supplement during war time, and after the war, as a global solution to world hunger. This is a section of my dissertation on the history of plankton science more broadly.

Translating Taxonomies: Sixteenth Century Animals for Twenty-First Century Readers ***Seán Thomas Kane, Binghamton University***

One of the priorities of my translation of André Thevet's 1557 book Les Singularitez de la France Antarctique is to identify the peoples, places, flora, and fauna which Thevet described in the framework of modern ethnography, geography, and taxonomy. This connects his sixteenth-century Atlantic world with the twenty-first century reader and affirms the value of Thevet and his contemporaries' natural history to modern studies. I will describe my process of identifying specific genera or species in that translation project, focusing on Thevet's animals along the Brazilian coast. It also elaborates on the value of indigenous knowledge to Thevet and the earliest roots of some modern taxa in the sixteenth-century natural histories which were read and cited by eighteenth- and nineteenth-century zoologists.

Revising and Reading Archimedes ***E. A. Hunter, University of Chicago***

David de Flurance Rivault's 1615 edition of Archimedes - likely used by Galileo, Fermat, Descartes, and Newton - was not intended for expert mathematicians but for French nobles with limited mathematical training. To suit this audience, Rivault made significant editorial changes: he added propositions, revised definitions, and restructured demonstrations into a more accessible, didactic format. This presentation explores why such an edition, tailored for non-specialists, became a key resource for leading early modern mathematicians. It argues that this was not an anomaly but reveals how early modern scholars encountered ancient Greek mathematics through layers of editorial and interpretive mediation. In doing so, it challenges traditional narratives of Archimedes' role in the scientific revolution and highlights the central role of editorial practice in shaping the transmission and reception of ancient mathematical texts.

Session Organizers:

E. A. Hunter, University of Chicago
Dalena Ngo, Yale University

Chair:

Dana Simmons, University of California, Riverside

099. Satellite Data, Environment, and Infrastructures of Power

Organized Session
11:00 to 12:30 pm - Saturday 15 Nov. Sheraton New Orleans: Floor 3rd Floor - Napoleon B2

Today, data generated with Earth-orbiting

satellites is crucial for producing scientific, economic, and governance-related knowledge about the oceans, atmosphere, land surfaces, and the communities that inhabit and manage them. These data are not neutral; they are actively collected, analysed, maintained, and shared through a vast infrastructure that must be historically situated. By examining the complex negotiations among data, technologies, practices, and knowledges across different, yet complementary contexts, this session sheds light on the infrastructures and power relations that shaped how satellite data were defined, who controlled them, and why they matter today. The first paper explores the First Panamerican Symposium on Remote Sensing (Panama City, 1973), highlighting its role in establishing enduring data governance and surveillance infrastructures that still influence debates on technological sovereignty, national security, and environmental management in the Global South. The second paper continues delving into the uneven geography of satellite data infrastructures, using case studies from Latin America and Africa to examine how remote sensing was promoted as a neutral tool for development and crisis response, while ultimately serving geopolitical and commercial interests. The commercial dimension of Earth Observation Satellite data is further explored in the third paper, which focuses on the early years of the European Remote Sensing Satellite, launched in 1991. It analyses how the development of Processing and Archiving Facilities enabled the transformation of raw satellite signals into usable data products and facilitated a market-oriented circulation of expertise and knowledge. Finally, the fourth paper turns to the International Geosphere Biosphere Programme (IGBP) between 1986 and 1997, exploring IGPB's role in shaping the broader history of international coordination on environmental research data sharing and diplomacy. Taken together, these papers critically examine the actors, institutions, and sociotechnical arrangements that influence the development, maintenance, and governance of environmental satellite data. With this, the panel aims to illuminate the power dynamics, inequalities, organizational structures and normative values embedded in satellite data practices.

Participants:

Cold War Geopolitics and Environmental Knowledge: The First Panamerican Symposium on Remote Sensing (Panama City, 1973) ***Sebastián Díaz Ángel, History of Science Institute, Autonomous University of Barcelona***

This paper examines the "First Panamerican Symposium on Remote Sensing," held in Panama City in 1973, as a critical site and moment for the establishment of satellite data infrastructures in the Americas. Organized by the EROS (Earth Resources Observation Satellite) Program of the U.S. Department of the Interior, the Pan American Institute of Geography and History (PAIGH), the Inter-American Geodetic Survey (IAGS), and Panama's "Instituto Geográfico Nacional Tommy Guardia", this symposium represents a key historical event for understanding how satellite technologies became embedded in hemispheric power relations during the Cold War. Drawing from the symposium proceedings and related archival materials, I analyze how remote sensing technologies were framed and promoted as necessary tools for national security, environmental management, and resource development across the Americas. The paper interrogates the symposium as a sociotechnical and diplomatic forum where U.S. experts—from different universities, research centers, and government agencies— negotiated regional data regimes and shaped knowledge and technological transfer between North and South American nations in the context of Cold War geopolitics. Particular attention is paid to interrogate how the symposium both reinforced existing power asymmetries and created opportunities for Latin American countries to assert influence over emerging satellite data infrastructures. By situating this symposium within broader contexts of Cold War politics in Latin America, this historical case study illuminates how early remote sensing collaborations established enduring patterns in data governance,

science diplomacy, and surveillance infrastructure that continue to shape our contemporary debates on technological sovereignty, national security, environmental management, and resource development in the Global South.

Remote Sensing, Remote Control: The Uneven Geography of Satellite Data in Africa and Latin America ***Grigoris Panoutsopoulos, History of Science Institute, Autonomous University of Barcelona; Andrea Alvarez-Laorden, Institut d'Història de la Ciència***

Since the 1970s, the United States and Europe have sought to expand their influence in Africa and Latin America through technical assistance programs, including the deployment of space-based technologies. Remote sensing was promoted as a neutral, peaceful application of space science—well-suited to addressing issues such as food security, land management, and environmental monitoring. Development agencies, satellite data distributors, and scientific institutions worked to expand the use of remote sensing data, while events such as the Sahel drought (1968–1973) marked a turning point in perceptions of its utility for humanitarian and environmental crises. At the same time, commercial satellite ventures like SPOT (Satellite Pour l'Observation de la Terre) Image increasingly leveraged the economic potential of satellite data for resource exploitation, cartography, and land-use planning. This paper examines two intersecting case studies: the African Remote Sensing Council and the construction of a SPOT data market in Latin America. These examples show how Africa and Latin America became central to the global circulation of satellite data, even as access, control, and interpretation remained concentrated in the Global North. Regional data centers emerged in cities like Nairobi, Kinshasa, Quito, and Bogotá, but they were embedded in systems of dependence shaped by training programs, commercial contracts, and international research networks. We explore how satellite data became a contested site of power: why and by whom it was collected, how it was processed, and under what conditions it circulated. By tracing these dynamics during the 1970s and 1980s, the paper argues that data practices were central to producing hierarchies of expertise and access and it shows how satellite data served not only as a technical tool, but also as a geopolitical instrument in the making of postcolonial scientific orders.

Data, Expertise, and Market: The Role of Processing and Archiving Facilities in the Early Stages of ERS-1 ***Hèctor Isern-Alsina, History of Science Institute, Autonomous University of Barcelona***

In 1991, the European Space Agency (ESA) launched ERS-1, the first European Earth observation satellite focused on ocean monitoring. The mission was conceived within the broader framework of a common European Remote Sensing programme, initiated in the early 1980s. ERS-1 aimed to routinely support both the physical oceanography community with satellite data and the applications sector—including private companies in fisheries, transportation, and oil, as well as public administrations interested in environmental monitoring. From the outset, ESA designed the ERS-1 mission with a data circulation strategy shaped by market-oriented mechanisms. This entailed not only the selling of satellite data, but also the development of a data infrastructure capable of encapsulating expertise, software, and resources into final, usable data products which could be transferred and circulated to third parties. In this sense, the market structure sponsored by ESA allowed the circulation of knowledge, practices and materialities in the shape of satellite data. Central to this effort were the four Processing and Archiving Facilities (PAFs), which played a pivotal role in transforming raw electromagnetic signals into specific, marketable satellite data products. This paper focuses on the role of the PAFs during the early stages of the ERS-1 programme, particularly during the

satellite's calibration and validation phase, when they were entrusted with key data processing responsibilities. What kinds of expertise did the PAFs develop? How did ESA make use of this expertise? Who benefited from it—and who was excluded? By addressing these questions, the paper argues that the data market-oriented approach adopted by ESA embodied, above all, a logic of knowledge production, circulation and management based on market mechanisms.

Satellites, (Big) Data and the International Geosphere Biosphere Programme, 1986-1997 ***Simone Turchetti, University of Manchester***

The recent history of data-generated satellites is yet to be written, but there is considerable evidence on the importance of the late 1980s and early 1990s as the period when there is a convergence between the power of satellites to offer greater coverage and higher spatial resolution, and that of data-storing technologies to provide more effective means for take these data sets to wider fruition. The combined ambitions of these technological advances allegedly helped to move into a research regime whereby monitoring, analysis and classification could seek to offer global reach. From the perspective of international environmental research activities, one chief example of how this globally reaching coordination was achieved through the International Geosphere Biosphere Programme launched by the International Council of Scientific Unions in 1986. A major enterprise, it entailed the participation of major national research organizations such as the US Geological Survey, NASA, National Oceanic and Atmospheric Administration and the European Space Agency. Beginning in 1993, a bespoke IGBP Data and Information System provided a one-kilometre land cover dataset charting variations in vegetation on the planet, and the widely transferrable dataset DISCover was available from 1997. This paper aims to chart the history of the IGBP as a transformative episode in the broader history of international coordination on environmental research data sharing and diplomacy. It also seeks to explore some of its tensions, by focussing especially on the contrast between the idealized prospect of global coverage and coordination and the dominance of US and Western Europe in these large-scale collaborative efforts, and the satellite and digital infrastructures that underpinned these efforts.

Session Organizers:

Gemma - Cirac-Claveras, Institut d'Història de la Ciència - UAB

Andrea Alvarez-Laorden, Institut d'Història de la Ciència

Chair:

Gemma - Cirac-Claveras, Institut d'Història de la Ciència - UAB

100. Making a Tropical Island: Classifying Taiwan's Place in the World, from the Qing Empire to the Cold War

Organized Session

11:00 to 12:30 pm - Saturday 15 Nov.

Sheraton New Orleans: Napoleon B3

On a map, the Tropic of Cancer cleaves Taiwan in two. The island's position on the globe has led colonists and outsiders to seek to assign its climate, diseases, people, and resources as belonging to, or defining, "the Tropics" . Yet across multiple colonial regimes – including the Qing empire (1683-1895), Imperial Japan (1895-1945), and the Republic of China (1945-present), as well as European and US projects – such classifications sometimes proved unstable. As its political status has routinely been disputed, so Taiwan's environmental identity has been epistemically contested, making the subject an ideal lens through which historians of science can consider how climactic classifications and colonial entanglements are intertwined. This panel critically interrogates the history and prehistory of Taiwan's tropicality. In so doing, we seek to shine a light on the liminality of "the Tropics" as both physical and discursive space, and the role of different kinds of 'science' in constructing and maintaining this entity. As a borderland – at once both a political and geographical frontier – Taiwan provides a lens through which to consider the creation,

investigation, and ‘conquest’ of tropicality, and to consider the consequences of such classifications. Our papers examine three different ways in which tropicality encountered Taiwan (or vice versa). Francis Newman studies how Qing-era designations of climate and disease fed into a particular conception of Taiwan’s environment. Lillian Tsay explores the connection between the extraction of tropical resources and the creation of ‘exotic’ tastes through the colonial Japanese confectionery industry’s exploitation of people and place. Finally, Shinyi Hsieh examines how US military projects reframed the theory and practice of tropical medicine in post-war Taiwan, emphasizing local people’s participation in reformulating colonial tropical medicine into a Cold War science.

Participants:

Dispelling Zhangqi: Dangerous Environments, Perilous Diseases, and Colonizer Bodies in Qing Taiwan ***Francis Aidan Newman, Harvard University***

Can a place be unhealthy? Many who arrived in Taiwan during the period of Qing dynasty rule (1683-1895) thought so, believing much of the island to be afflicted with pestilential environments. This was true of many Qing officials and physicians, as well as ordinary Han settlers from Chinese coastal areas. Each of these groups, in slightly different ways, complained about, suffered from, and attempted to make sense of their fears. Their explanations often centered on the concept of zhangqi (sometimes translated as ‘miasma’), a dangerous thing that emanated from the water, land, and winds of Taiwan, and involved a reconceptualization of the climate and people. Using gazetteers, travel accounts, medical texts, and bureaucratic documents, in this paper I examine how these various Qing-era colonists deployed their knowledge systems, bodies, and environments to attempt to solve a health problem. Dispelling zhangqi was possible. For example, you could prevent it invading your body by eating and drinking certain things, as prescribed (or not) in authoritative texts. You could pray to expel plague gods and ghosts through religious ceremonies. Or you could transform the environment itself, and change the climate by building towns, farmland, train tracks, and other institutions of ‘civilization’. Thus different kinds of colonists attempted to solve a bodily problem by the physical and spiritual colonization and transformation of the environment around them, and in so doing, they began to construct a new climactic identity for the island and its inhabitants.

Sweetness from the South: The Role of Colonial Taiwan in the Making of Japanese Western-Style Confectionery ***Lillian Tsay, Brown University***

This paper examines how the commercial success of the Western-style confectionery (yōgashi) such as caramels and chocolate in modern Japan was largely built upon the colonial capital in Taiwan. While studies have already acknowledged the importance of Taiwan’s colonization (1895-1945) in Japan’s sugar industry, this paper explores the tension between sweetness and power in the Japanese Empire through the lens of Western-style confectionery, particularly its utilization of tropical resources such as bananas and cocoa in Taiwan. Among the leading confectionery corporations in prewar Japan, two maintained particularly strong connections with colonial Taiwan. Niitaka Confectionery, once renowned for its chewing gums and caramels, was established in Taipei by Japanese settler Mori Heitarō. Although Mori had no formal ties to the colonial government, he developed a banana-flavored caramel that came to embody the empire’s exoticizing tastes and imperial imagination. In contrast, Morinaga Confectionery, best known today for its iconic caramels, pursued a more direct collaboration with the Governor-General of Taiwan. In the 1940s, the company initiated efforts to cultivate cocoa—a commodity Japan lacked and relied on foreign imports—in East Coast Taiwan. This project, however, came at the cost of displacing the

Indigenous Paiwan people, whose descendants continue to live in a village that still bears the company's name "Morinaga." Drawing on archival sources and oral histories, this paper reveals that despite the common perception of Western-style confectionery as a symbol of modernity, its production was deeply rooted in the extraction and exploitation of tropical resources from Japan's southern colony.

Making Tropical Medicine in the Field and in the Blood: U.S. Naval Research (NAMRU-2) in Taiwan, Guam, and Southeast Asia (1946–1979) ***Shinyi Hsieh, Taiwan Social Reslience Research Center, National Taiwan University***

This paper examines how U.S. navy tropical medicine in postwar Taiwan and broader Southeast Asia redefined itself as "cooperative"—aligning with Cold War development ideals and the emerging molecular and biochemical sciences—actively distancing itself from earlier colonial regimes, while still reproducing imperial logics. Focusing on the U.S. Naval Medical Research Unit No. 2 (NAMRU-2), which operated in Guam, Taiwan, Da Nang, and Jakarta between 1946 and 1979, I analyze field notes, photographs, reports, and narratives to trace how Cold War science reformulated colonial tropical medicine. In contrast to the heroic images of solitary U.S. field researchers in the 1950s, NAMRU-2 emphasized local collaboration. Taiwanese children, physicians, technicians, and officials featured prominently in its materials, not only as assistants but as symbols of American-led "cooperative" modern science. This framing served to differentiate U.S. military medicine from both European and Japanese colonial traditions in the region—what NAMRU-2 publications criticized as "big game" science driven by personal or commercial interests. While animal collection remained part of the work, NAMRU-2's focus shifted toward measurable biological indicators—like hemoglobin levels and blood parasites, reflecting the rise of molecular biology and biochemistry. Places like Gueishan Island, Penghu, Luzon, Tagudin, and the village of Ranau were valued for their strategic "isolation," while tropical fieldwork was framed as a shared endeavor, captured in photographs of American, Taiwanese, and Filipino technicians and children helping collect samples togethers. Taiwan and the wider Southeast Asian region became not only field and laboratory spaces but also collaborative partners in this postwar reimagined tropical medicine.

Session Organizer:

Francis Aidan Newman, Harvard University

Chair:

Hsiu-yun Wang, National Cheng Kung University

101. Improving Professional Development in History of Science Graduate Training (GECC Professionalization Event)

Roundtable

11:00 to 12:30 pm - Saturday 15 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon C

Graduate training in the history of science is primarily designed to prepare graduate students for academic careers involving research and teaching duties. Programs face the dual challenge of meeting their students' professional development (PD) needs for a difficult academic job market and their desire for PD that supports broader career interests and skills development. What kind of PD opportunities do graduate students want? What valuable opportunities might students not know they need? How can faculty and administrators in graduate programs support graduate students' professional development, both within and in parallel to the curriculum, given changes in the higher education landscape? In this interactive workshop, participants will hear from a panel of speakers, including current and recent students, faculty members, and administrators/GPDs, about designing professional development opportunities that usefully anticipate the uncertainty of the academic job market and reflect realistic and relevant goals and support for graduate students. Participants will be able to share their goals and experiences in mentored small groups. The session will end with a facilitated discussion/Q&A

period.

Session Organizer:

Ellie Louson, Michigan State University

Chair:

Ellie Louson, Michigan State University

Participants:

Katherine White, University of California, San Diego

Mary Kate Wolken, University of Minnesota

102. Early Sciences Forum: Liminality and the Margins of Disciplines

Organized Session

11:00 to 12:30 pm - Saturday 15 Nov.
Sheraton New Orleans: Floor 4th Floor - Nottoway

The most valuable scientific work is often done at the boundaries of knowledge. In the ancient world as in the modern, science was tested at the limits of its expertise, where it was forced to engage with other practices and epistemologies in order to address matters beyond its normal purview. This panel by the Early Sciences Forum will survey a variety of instances in which ancient scientists operated productively at their own disciplinary margins. From environmental studies of sea monsters at the edges of the world, to the interface between astronomical theory and material science in the manufacture of sundials, to the incorporation of rhetorical practices into physiology and medicine, this panel will explore the places where ancient scientists met the limits of their knowledge, and how they reached beyond them.

Participants:

Where the Sea Beasts Tarry ***Georgia L Irby, William and Mary***

Pomponius Mela describes the Caspian Sea as harrowing with its savage and port-less setting agitated by windstorms. Even more, the marine fauna of the Caspian Sea is predominately comprised of sea monsters which consequently makes the waters all the less navigable (beluis magis quam cetera refertum et ideo minus navigabile: 3.38). Pliny adds the tantalizing detail that sea monsters are observed around the solstices (in mari beluae circa solstitia maxime visuntur, followed by storms (NH 9.4-5). Mela and Pliny are probably referring to whales, which were not altogether understood in antiquity, existing “at the margins of belief in antiquity,” as creatures more mythical than biological (Llewelyn-Jones and Lewis, Culture of Animals in Antiquity, 2018: 417). Elsewhere, in literature and art, sea monsters of various types appear in stormy waters or hunting after shipwrecks. For example, the Roman poet Albinovanus Pedo imagines sea-monsters (marinis feris) lying in wait to feed on victims of a turbulent storm on the river Ems that caught up the Roman fleet in 15 CE under Germanicus’ command (Seneca the Elder Suasoria 1.15) Like other wild beasts that inhabit other undesirable landscapes, sea monsters emphasize the liminality and inaccessibility of remote and dangerous waterscapes. In this talk I will explore more deeply the connection between water “monsters” and their environments, and their symbiotic relationship: how do deep waters forge and define sea monsters (especially, whales and sharks)? How does the presence of sea monsters, in turn, affect the environment in which they live and hunt? I will conclude with a brief consideration of sea monsters on Medieval and Renaissance maps and their disappearance from the cartographic record with the Age of Enlightenment.

Sundial Manufacture in Ancient Greece and Rome ***Nicholas Laurence Winters, Northwestern University***

While sundials are often seen as a rudimentary and even primitive method of timekeeping, they were in fact ingenious achievements of astronomical precision, and were (literally) the cutting-edge technology of their time. In addition, they were clearly prestige objects compared to earlier timekeeping practices. Both as public monuments and as private possessions, sundials became increasingly complex and playful throughout the Greco-Roman world, showing off the virtuosity of the designers. This paper seeks to answer the question: who made these sundials? While scholars have identified several centers of production, only six sundials from the ancient

Mediterranean are inscribed with the names of their makers. Moreover, the skills necessary to design a dial face were very different from those of the sculptor and the inscriber who would produce the dial itself. The manufacture of a sundial would thus require a coordinated team of highly skilled experts, most of whom, it seems, never received public recognition for their work. This paper will survey the evidence for sundial production and explore what it can tell us about the role of scientific expertise in the labor economy of the ancient world.

Orator Patiens: Therapeutic Rhetoric in Aelius Aristides's Hieroi Logoi ***Hana Mengyao Liu, Stanford Classics***

My paper analyzes from a medical perspective the rhetorical practices of Aelius Aristides in Hieroi Logoi I-III. I argue that his rhetorical exercises should be considered as a case of the actual practice of therapeutic rhetoric, a method well attested in a long tradition of Ancient Greek medical texts. This study addresses the therapeutic usage of vocal practices, a concept that sheds light on the fluid boundary between rhetoric and medicine. While these practices have been long studied (Rousselle, Finney, Pietrobelli, Petridou), the sources are mainly medical texts written from the physician's perspective. However, Aelius Aristides's Hieroi Logoi presents us with a rare literary text written by the patient himself, whose biography is well-known to us. In this text, Aristides recounts his experiences of chronic disease, periodical intermissions and recovery, as well as how he obtained the highest honors as an orator under the egis of Asclepius. The argument of this paper proceeds from three sets of evidence. Firstly, passages from medical treatises (Regimen in Health of Hippocrates, Celsus, and Oribasius) provide us with the conceptional grid of therapeutic rhetoric - its physiological basis and practical principles. Secondly, I examine Aristides's descriptions of his rhetorical practices in relation to his own physical ailments (Hieroi Logoi, IV 15, 17, 22) and compare them to the data from medical treatises. In the third part, I consolidate my argument that Aristides's rhetorical practices reflect a medical underpinning for vocal exercises. To substantiate this claim, I draw on historical evidence that connects Galen and Aristides. Galen clearly argued against Aristides' rhetorical exercises, establishing causal relations between Aristides's passionate engagement in rhetoric and his physical consumption.

The Silence of Water in Archimedes' Floating Bodies (3 bc) ***Angélique Félicia Edwige Lemarchand, Nantes Université***

In the Floating Bodies (3 bc), more exactly, On things being carried, Archimedes plays with physics and mathematics at the water's edge — though never using the word. This presentation will explore how the silence of water pervades this scientific text, actually revealing its power through another word (τὸ ὑγρόν, the liquid) so repeated that it sounds like it has something to say. Something new, is my impression, which presents us with a translation challenge. What is this liquid background, eventually reduced to a line by Archimedes? What is the scientific past of the word and how does it take part in Archimedes' mathematization of physics? I would like to consider this special liquid-device and assess its impact on science.

Polygonal Numbers and Pebbles: An Answer to a Much-Debated Piece of Early-Pythagorean Mathematics? ***Lorenzo Salerno, Stanford University***

The aim of this paper is to discuss a much-debated testimony on early-Pythagorean mathematics, the Aristotelian account of some sort of mathematical practice employed by the Pythagoreans to clarify their own theses on the metaphysical concepts of Odd and Even. Even though the involvement of figurate numbers in this practice was never debated, the commentators (starting from late antiquity) understood it as featuring only squares and rectangles; the possibility of representing more complex polygonal

numbers, whose presence in later arithmetic is prominent, was discarded under the assumption that they had not been developed yet in Aristotle's time. I will argue that our reasons for thinking this are weak, and that the polygonal numbers figured in all probability in this Pythagorean practice; this will also help us to understand their broader philosophical claims, and how Pythagorean philosophy helped the development of mathematics and vice versa. Moreover, on the one hand, this will clarify the stages of the process by which the interaction between practical skills and "hard" science led a tool for measuring right angles (the gnomon) to become an astronomical object (i.e. a part of the sundials), and then the most abstract arithmetical device used to create new polygonal numbers from the previous ones; on the other hand, this will also broaden our understanding of the features of the arithmetic carried out using pebbles on a counter, which is at the center of the current debate on the materiality of Pythagorean mathematical practices.

Session Organizer:

Nicholas Laurence Winters, Northwestern University

Chair:

Liba Taub, Cambridge University

103. Scientific Genealogies of Whiteness as Natural Norm

Organized Session

11:00 to 12:30 pm - Saturday 15 Nov.
Sheraton New Orleans: Floor 4th Floor - Oak Alley

Papers in this session explore, through the examples of polygenism in race science, pain in oncology and African American patients, and the desert in Californian eugenics, how the seeming universality of scientific knowledge was built on the extrapolation of whiteness as the "default setting" of humanity. Soleiman will explore the treatment of whiteness was rendered natural and neutral through the use of white male patients as universal model subjects; and will interrogate how in-built assumptions about entire populations were based on the characteristics either favored or embodied by scientists themselves. In this sense, papers explore how the construction of "abnormality" or the "pathological" could both reify non-white subjects as "deviations" and become blind to their pain and illness given their non-alignment with the tacit ideal of white humanity. Thus, by deracializing whiteness, and eliding its imprimatur in the process of knowledge making, scientific and medical knowledge adhered to a faulty universal. Inquiring about the whiteness of knowledge production in polygenic race science and eugenics, Marcos and Spaulding papers explore how white knowledge and knowers render themselves invisible, and thus natural and neutral, through its capacity to define its others and classify in them undesirable features – features which render them into contenders for elimination. Spaulding, particularly, excavates how the most emblematic Californian landscapes – the desert, the farm, the beach, the mountain – were gradually produced, through eugenics, as landscapes of white possession and indigenous extinction. Marcos, lastly, emphasizes how the work of division and discreteness in knowledge production silently enshrines as universal and hegemonic a singular way of knowing. Through the work of classification, taxonomy, and polygenic race science, physicians and scientists rendered segregation, slavery, and racial hierarchy into a fact of nature. Far from being the only mode of producing natural knowledge, splitting to classify, asserts ownership, control, and power. This epistemic orientation, equated with whiteness and settler colonial dispossession, goes against indigenous ways of knowing and the understanding of humans as existing in a continuum with nature.

Participants:

Epistemic Whiteness: Classificatory Discreteness, Polygenism, and the Demise of Early Modern Categories of Being ***Patrícia Martins Marcos, University of Oklahoma***

According to the Egyptian feminist and physician Nawal El-Saadawi (1931-2021), after completing her medical education, she realized how unequipped she was to handle matters of health and disease. After years of painstaking training on how to cut and suture, El-Saadawi noted she left medical school with only "fragmentary

knowledge." That is, she had learned to analyze and study illness in disconnected bodily domains. This paper delves into this turn towards discreteness, which I submit, is the dominant epistemic value of scientific and medical modernity. Beyond a way of seeing and knowing, discreteness privileged a disaggregated ontological view of the body. Freed from holism, each somatic part—the liver, lungs, womb, or brain—became an expert domain supporting the expansion of medical professionalization through specialized subdisciplines—i.e., hepatology, pulmonology, gynecology, neurology. Frederick Douglass, too, in "The Claims of the Negro, Ethnologically Considered" (1854), produced a thoroughgoing critique of polygenism, noting how its classificatory incongruencies were moored to "an age of science" which "is favorable to division." Excavating the genealogy and development of the scientific impulse to classify and divide, this paper approaches polygenism as an emblematic manifestation of this novel epistemic orientation to split rather than lump. I posit this orientation was first expressed in the project of control and scientific ambition to, as Linnaeus put it, "encompassing the universal," articulated in eighteenth-century natural history and taxonomy. In radical rupture with the non-disciplinary early modern tendency to hyphenate and produce knowledge along multifarious lines, this paper explores how the splitting impulse reified whiteness as natural, neutral, and as universal as scientific knowledge itself.

"Wasteland to Date Garden:" Eugenics, the Environment, and Agriculture in the California Desert ***Margaret Maeve Spaulding, UCLA***

Before Paul Popenoe co-authored the popular tracts Applied Eugenics (1918) and Sterilization for Human Betterment: A Summary of Results of 6,000 Operations in California, 1909-1929 (1929), he was a date grower. Hired by the USDA in 1911 as an "agricultural explorer," Popenoe traveled throughout the Middle East and brought cuttings of the first commercial date palms to the United States. This presentation will uncover what eugenic lessons Paul Popenoe took from the date palm trees that he transplanted into the soil of Coachella Valley. Previous historians have shown how the conservation movement inspired eugenicists, who anthropomorphized trees and forests in order to make eugenic arguments about racial preservation. This presentation will reveal how a different environment—the desert—and different circumstances—agricultural expansion—nonetheless led to a similar result, wherein scientists projected their eugenic imaginations onto the California desert. This discussion will further reveal how Californian promoters, from travel writers to date suppliers, used eugenic science to advertise the desert and the date to the larger public. Given that the palm tree would become emblematic of the state of California itself, this presentation offers an entry point from which to unravel the many lives and landscapes that eugenics affected in America's most eugenically-influential state. Ultimately, we explore how this landscape – and the racial assumptions it reified – were premised on the projection of an idealized human subject who embodied whiteness and rendered it universal.

The Pain of Racial Injustice: Richard Payne and the Whiteness of End-of-Life Care ***Matthew Soleiman, University of California, San Diego***

In 2000, the African American oncologist Richard Payne authored an editorial in The Washington Post on the fears of his Black patients of end-of-life care. As the chief of the Pain Service at the Memorial Sloan-Kettering Cancer Center in New York City, Payne had found that, at the ends of their lives, Black patients tried to avoid the long-standing racism of American medicine as much as possible. They did not want to die in pain. Building upon recent work from scholars on the Whiteness hidden in the modern sciences of pain and addiction, this talk shows how

Payne at once challenged and reinforced such Whiteness in the United States. While Payne joined other American scientists and physicians of the late 1990s and early 2000s in advocating for greater opioid prescribing, he sought to make visible and in turn correct the disproportionate undertreatment of pain in poor Black and Brown patients, especially those dying of cancer. Within New York City, Payne helped to establish the Harlem Palliative Care Network, through which he and his colleagues expanded the access of minority communities to pharmaceutical opioids. Amidst an emerging epidemic of opioid addiction and overdose among whites, Payne also publicly defended Purdue Pharma's latest product, OxyContin, as part of the solution to health injustice. At the same time, however, Payne urged scientists and physicians to move beyond "race" as a "social construct" to ultimately understand pain and disease on an individual, rather than structural, level.

Session Organizer:
Patrícia Martins Marcos, University of Oklahoma

Chair:
Patrícia Martins Marcos, University of Oklahoma

Commentator:
Pratik Chakrabarti, University of Houston

104. Thinking like Machines: Computation, AI, and Origins

Contributed Paper Session
2:00 to 3:30 pm - Saturday 15 Nov.
Sheraton New Orleans: Floor 4th Floor - Bayside ABC

Participants:

Information Before Informatics: Thermodynamics, Psychophysics, and the 19th Century Foundations of Computation *Won Jeon, University of California, Santa Cruz*

The 19th century laid the conceptual groundwork for modern artificial intelligence (AI) and machine learning (ML), with figures like James Clerk Maxwell and Gustav Fechner shaping ideas that would later animate cybernetics and informatics. Maxwell's theories on governors, designed to regulate feedback in steam engines, and his famous demon—who violated thermodynamic laws—articulated a foundational informatic principle: the management of uncertainty as the production of order. Fechner's psychophysics, transforming subjective sensation into measurable regularities of stimuli, attempted to bridge physics and psychology, offering a model for translating the complexities of human perception into quantifiable systems. These early explorations of prediction and measurement paved the way for the operationalization of information in the mid-20th century by cybernetics pioneers like Norbert Wiener and Claude Shannon. This paper traces the influence of Maxwell's thermodynamics and Fechner's psychophysics on the development of modern computational systems, particularly natural language processing (NLP) technologies like large language models (LLMs). I argue that these 19th-century experiments encoded an epistemological drive that continues to shape AI today: a relentless pursuit of efficiency, control, and optimization, rooted in the political economy of capital accumulation. As AI reduces language to an algorithmic mechanism of growth, it forecloses the potential for epistemological change, creativity, and higher-order learning—an intellectual trajectory that emerged at the zenith of industrial capitalism, driving technological ambitions of control, efficiency, and optimization that persist in contemporary AI architectures.

The Optical Way of Seeing: Capturing Light through Algorithms in Early Computer Vision *Sokion Choi, Seoul National University*

This paper examines the early history of "physical" computer vision, with particular focus on two pervasive techniques: "shape-from-X" and "optical flow." It explores how AI researchers in the 1970s and 1980s reconceptualized optical problems from a cognitive perspective.

During the 1960s, scientists transformed perception from an objective to a subjective problem by analyzing stereopsis through the lens of semiotics rather than traditional geometry. They established the new field of computer vision, positioning perception as a subset of intelligent behavior—one that mirrors the psychology of internal representations rather than the physics of image formation. However, when AI practitioners came out of the cave of "micro-worlds" and confronted the real world, they had to face the reality that vision is a realm full of splendid and glaring optical phenomena. To address this challenge, they analyzed image understanding through the scheme of inverse optics—the reverse process of image formation—while maintaining parallels between human and computer vision by distinguishing between light as a physical entity and illumination as a cognitive category. Through this approach, they continued the intellectual tradition of psychophysics ranging from Ernst Mach to James Gibson, forging a model of visual subjectivity that seeks to establish a fixed frame of reference in a flickering world.

Re-Embodying the Interface: A Historical Inquiry into Human-Computer Interaction ***Chenqi Zhu, Shanghai International Studies University***

This paper presents a historical inquiry into the evolution of human-computer interaction (HCI), focusing on the shifting role of the human body and sensory perception in mediating technological experiences. By tracing the trajectory from early symbolic interaction systems—such as punch cards and textual command lines—through the advent of graphical user interfaces and touch-based devices, to contemporary immersive technologies like virtual and augmented reality, we argue that HCI has undergone a gradual but significant re-embodiment process. No longer passive or peripheral, the human body has become an increasingly central agent in interactional loops, both as a site of input and a terrain of experiential transformation. Building on theories from phenomenology (Merleau-Ponty), posthumanism (Hayles), and media archaeology (Zielinski, Parikka), this study reconceptualizes HCI not merely as a technical discipline but as a cultural and philosophical formation. We consider how each interface paradigm reconfigures sensory hierarchies, modes of attention, and assumptions about agency. In particular, the rise of gesture-based, voice-activated, and affect-responsive systems illustrates a turn toward somatic computing, wherein the body is not simply a conduit but a dynamic participant in computational meaning-making. Moreover, we examine recent advances in brain-computer interfaces (BCIs), biometric feedback systems, and AI-driven adaptive environments, arguing that these systems reflect a growing epistemic shift: from representational cognition to embodied, situated, and performative modes of knowledge. The paper concludes by reflecting on the political and ethical stakes of this transformation. What does it mean when machines anticipate bodily movement or emotion? What kind of subjectivity emerges in an environment that co-produces intention and perception? This study contributes to recent discussions in the history of computing, media archaeology, and the embodied turn in science and technology studies.

Between an "Infinity of Problems": 1980s Artificial Intelligence, Generality as Epistemic Reconfiguration, and Human Flourishing ***Aaron Mendon-Plasek, Purdue University***

While drawing on analogies between neural networks and brains to justify neural networks' potential efficacy for "search," "representation," and "learning," a number of 1980s connectionist researchers argued neural networks were an epistemic "middle ground" bridging the methods, tools, and practices popular in pattern recognition and the problems, ambitions, and "expansive representations" exemplifying then-current artificial intelligence efforts. The flexibility of neural networks to perform both the "pure memory storage" of

so-called “parameter optimization” approaches that were endemic pattern recognition as well as heuristic-based approaches endemic AI expert systems research—i.e., very different tasks judged by very different criteria—made connectionism into a lightning rod for criticism. Connectionist researchers retorted with a definition of “generality” as the capacity to translate between radically different epistemologies. I argue that technics like backprop were far less important to the professional, technical, and social reconfiguration of late 20th century AI when compared to the epistemological appeals to nominalism rooted in appeals for greater “generality” for recognition tasks. To do this, I trace a particularly virulent articulation of nominalism during this time that framed “objectivity” as a special case of subjectivity and was motivated, in part, by practical pattern recognition problems involving metaphor, analogy, and contradiction. I conclude by discussing how contemporary efforts to regulate large language models (LLMs) have been alienated from these histories. Understanding these histories help us to see how LLM use is reshaping social and legal imaginaries linked to narratives of human flourishing and government obligation.

105. Miraculous Sights and Sounds: Disability and Knowledge

Contributed Paper Session
2:00 to 3:30 pm - Saturday 15 Nov.
Sheraton New Orleans: Floor 3rd Floor - Borgne
Participants:

Miracles on Trial: Disputing Efficacy in Sight-Restoring Surgeries (1800-1850) ***Jingwen Li, Princeton University***

The early nineteenth century saw the rapid establishment of eye hospitals across an expanding global network— from London, New York, and Philadelphia to colonial Calcutta and missionary outposts in Canton. Anglo-American physicians hailed the unprecedented volume of patients these hospitals attracted as proof of the superiority of “scientific medicine.” Reports from these institutions, along with popular accounts, were saturated with narratives of miraculous recoveries and immediate cures following sight-restoring surgeries. Nowhere was this rhetoric more potent than in China, where missionary doctors presented the restoration of sight to the blind as emblematic of the success of western medicine. But was the blind truly restored to sight? This paper argues that the reality was far more complex—and far more revealing—than these triumphalist narratives suggest. By focusing on the often-overlooked and surprisingly frequent disputes over the outcomes of such operations, the paper reconstructs the intricate and uncertain processes of healing. Drawing on three categories of sources—patient self-accounts, legal documents involving medical disputes, and critical re-readings of physicians’ reports—the paper highlights the contradictions surrounding claims of efficacy. The challenges of defining and communicating visual experience, I argue, posed significant problems for the emerging medical profession, complicating their efforts to standardize evidence and assert authority within transnational networks of eye care.

Even the Deaf Can Tune: Experimenting/Experiencing Acoustical Knowledge in Marin Mersenne’s Harmonie Universelle (1636) ***Joyce Wei-Jo Chen, University of Oregon***

Even the Deaf Can Tune: Experimenting/Experiencing Acoustical Knowledge in Marin Mersenne’s Harmonie Universelle (1636) In the third book on stringed instruments in his Harmonie Universelle, Mersenne makes the curious claim that: “A deaf person can tune the lute, viol, spinet, and the other stringed instruments and find such tones as he wishes if he knows the length and thickness of the strings: whence comes the tablature for the deaf.” Mersenne believes that with precise measurements and a recipe for tuning, anyone—even a deaf person—can successfully tune an

instrument based on other sensory information: the tactile response of the firmness of the string as well as the visual estimation of a string under optimal tension. Mersenne often uses these musical instruments to investigate and illustrate acoustical principles and theories. Central to Mersenne's thinking was the notion that his methods and experiments, if repeated precisely, would inevitably produce the same results. Mersenne's usage of musical instruments In this paper, I will highlight three acoustical innovations found in Mersenne's Harmonie Universelle and how the idea of experience and experiment played a significant role in the development of acoustical theory in the early modern period. First, Mersenne conceived sound both as motion and substance, as he compared sound with optics in terms of kinetic motion and physical properties. Secondly, Mersenne continued questioning his experience of hearing multiple sounds simultaneously and exploring the idea of overtones. Lastly, Mersenne utilized sound—the echoes of his voice—as a scientific tool for measuring the speed of sound. I suggest that Mersenne's experience as an accomplished musician and experimental results from working with various musical instruments helped produce acoustical knowledge in Harmonie Universelle. More broadly, this paper will also show that the notion of experience/experiment not only shapes the scientific method but also transforms many early modern experiments.

Medicine or Miracle?: The Cure of Hearing Loss and Its Ideological Implications in Socialist China *Shu Wan*

Today, deafness/hearing loss at birth is still widely perceived as a congenital disorder in Chinese society, and it is believed to be cured by the development of gene therapy. Concerned about the origin of this ableist comprehension of deafness in socialist China, this paper explores the dynamics within the cure of hearing loss between the 1950s and 1970s. While the Western biomedical knowledge of cure of hearing loss was sporadically introduced into China before 1949, the communist government first made comprehensive attempts to translate the Soviet Union's medical knowledge in the 1950s. The progress in treating deafness was interpreted as a socialist miracle in the 1950s. In correspondence with Chairman Mao's advocacy for Traditional Chinese Medicine (TCM) and its pharmacy in the late 1950s, acupuncture and its application in cure of hearing loss gradually drew attention from physicians and deaf educators. They collaborated on experimenting with treating deafness, which was viewed as proof of TCM's legitimacy. During the Cultural Revolution (1966-1976), the development of acupuncture in cure of hearing loss was further endowed with ideological implications. The acupuncture in treating deafness was further enhanced and entwined with the social Maoist miracle of "breaking off the forbidden zone," while proving a myth later on. Through the lens of the cure of hearing loss, this paper contends for the interference of ideological concerns with medicine in socialist China.

106. Teaching and Textbooks in the History of Science

Contributed Paper Session
2:00 to 3:30 pm - Saturday 15 Nov.
Sheraton New Orleans: Edgewood
Participants:

"Improving…our Countrymen": University Science, Mechanics Institutes, and Agricultural Societies in the United States, 1820-1850" *Laura Clerx, Boston College*

"There is nothing like down East for learned women. Why, even the factory-girls at Lowell edit entirely a magazine…Some of them, having fitted their brothers for college at home, come to Lowell to earn money enough to send them through!! Vivent les femmes." wrote the botanist Asa Gray to John Torrey in the summer of 1842 (Letters of Asa Gray vol. 1, ed. by Jane Loring Gray, Boston and New York: Houghton, Mifflin & Company, 1893). The connection between nineteenth-century

industry and education in the professor's boast was more than apparent. Hired as Professor of Botany at Harvard in 1842, Gray became part of a circle of New Englanders who promoted the dissemination of scientific education to the laboring classes. The involvement of the American university in the industrial economy is typically conceived of as a late-nineteenth-century phenomenon beginning with the establishment of the Morrill-Land Grant universities in the 1860s. In this paper, I argue that the scientific establishment in the United States has been bound up with national economic development from the earliest days of the new republic. This paper explores attempts by educators, politicians, and semi-professional scientists to guide U.S. economic progress by bringing a particular type of scientific education to workers and farmers through the establishment of mechanics institutes and agricultural societies. By examining these early to mid-nineteenth-century organizations in more detail, this paper brings to light the class dimensions of scientific knowledge and experimental culture in the period of early labor organization in the United States.

Science as Intellectual Inquiry or Social Practice? Contesting Cold War Curricula in 1960s Japan ***Duim Huh, The University of Tokyo***

In the 1960s, the American curriculum—particularly the Physical Science Study Committee (PSSC)—had a significant impact on Japan, contributing to experimental science teaching amid strong local pressure and debate among educators over its adoption, which left Bentley Glass "greatly impressed" during his 1965 visit. The PSSC curriculum, part of U.S. cultural diplomacy during the Cold War, promoted international science framed as inquiry-based learning and free, democratic knowledge exchange. Its dissemination relied on cooperation with local scientists and educators who aligned the initiative with practical goals of nation building or securing funding. Previous studies tend to portray recipient countries as monolithic, overlooking internal differences among local actors. This study aims to decentralize the narrative of the dissemination of Cold War science education by foregrounding these contested roles. While some Japanese scientists and educators supported the PSSC by translating textbooks and adopting experiment kits, others critically assessed its content, experimental focus, and underlying 'philosophy.' Influenced by a Marxist view of science, several scientists and historians of science criticized the PSSC for detaching science from social contexts, in contrast to Soviet materials. Prefectural-level educators' groups within the Japan Teachers Union similarly scrutinized the PSSC's content and experiments, often objecting to its perceived glorification of human reasoning through inquiry-based learning. These critical perspectives contributed to the development of new curricula, textbooks, and experiment kits, complementing the efforts of reform-minded scientists and educators who collaborated with their American counterparts. This study highlights the peripheral dynamics of the Cold War-era American science network, revealing how its ostensibly 'apolitical' rhetoric of science diplomacy provoked political debate over science education in 1960s Japan.

Textbooks: A Useful Object for the History of Technology and Sociology of Science ***Kelcey Gibbons, MIT***

After over a century of working within the legal confines of segregation, and the a social perception of being technologically backwards, in the 1960s Ebony magazine advertised Black computer workers, engineers, programers, and librarians as middle class, equipped with the niceties of the American middle class, but with a radically different historical trajectory, sense of social responsibility, and professionals cultivated to meet them. I center the textbook as a technology that when organized together formed a kind of curriculum. Deployed within classrooms,

situated within. By thinking with objects like textbooks, within institutions of social production like universities, I study engineering as a pursuit organized by the economic demand for skilled labor to make, maintain, and manage a modern society between 1830s and the 1960s. My study is bi-directional asking: how has engineering education shaped black people and how have black people shaped engineering education?

107. Divining Sciences in Islamic Scholarly Traditions

Contributed Paper Session
2:00 to 3:30 pm - Saturday 15 Nov.
Sheraton New Orleans: Napoleon A1

Participants:

Geometry in Islamic Theology ***Robert Morrison, Bowdoin College***

By the post-classical (post-1200 CE) period, Islamic theology (kalām) texts contained extensive discussions of science and natural philosophy. In 1994, A.I. Sabra published a landmark article in which he demonstrated that the authors of these texts adopted terminology and topics from Islamic philosophy and that there was a pitched debate over the epistemological claims of disciplines such as astronomy. Since then, other scholars have built on, revised, and sometimes contested Sabra's conclusions. In this presentation, I will survey discussions of geometry in post-classical theology texts, a line of investigation that has so far received less attention. Compared to astronomy, the elegance of geometric demonstrations was indisputable; there was no room for complaining about observations! While astronomy was relevant for discussions of God's relationship to creation, geometric demonstrations implicated definitions of time and the infinite, both of which influenced the theologians' conception of matter. In additions, conceptions of the infinite were relevant to theologians' arguments for creation ex nihilo. The scholar Muṣliḥ al-Dīn al-Lārī (d. 1572), who was born in the Safavid Empire and died in the Ottoman Empire, explored the theological ramifications of geometry in the midst of a treatise entitled Risāla fī al-ʻulūm al-mukhtalifa (An Epistle on Various Sciences). Specifically, he explored the ramifications of the horn angle, the angle formed where a tangent line meets a circle. Although Euclid had demonstrated that the angle was the most acute possible, Lārī responded (with his own demonstration) that, in fact, a right angle comprised an infinite number of these angles. I will emphasize how geometry was adduced by many sides of theological debates.

The Transmission of a Hermetic Tradition in a Fourteenth-Century Encyclopedic Manuscript Miscellany from Shīrāz ***Dominique Sirgy, Yale University***

Köprülü 1589 is an unfinished encyclopedic miscellany was produced in mid-fourteenth century Shīrāz. In this paper, I focus on the inclusion of a Neoplatonic text attributed to Hermes in Köprülü 1589. Scholars who study Hermetic corpora, including Garth Fowden or Brian Copenhaver, have debated whether the practical Hermetica and the philosophical Hermetica constituted a single corpus. I contribute to this debate by showing that, in the Arabic and Persian written tradition of fourteenth-century Shīrāz, philosophical Hermetica and the practical occult sciences were taught alongside one another. I will demonstrate how Köprülü 1589's patrons and scribes organized these various fields of knowledge using texts like *The Rebuke of the Soul*, attributed to Hermes, as well as medical works which recommend the use of practical magic such as talismans, recipes, physical rituals. Because Köprülü 1589 also contains works on the traditional Islamic sciences, like Quran interpretation or the history of the Prophet Muhammad, and works drawn from the Sufi tradition, this presentation will also explore the relevance of these materials to Hermetic thought in the context of scholarly debates alive in fourteenth-century Shīrāz.

Knowing Metals and Minerals in Mamluk Egypt (1250-1517 CE) ***Anthony T Quickel, Max Planck Institute for the History of Science***

With both the history of science and the environment being nascent fields in the study of Islamicate Egypt, the knowing and using of metals and minerals during the Mamluk Sultanate (1250-1517 CE) remains unstudied. Until now, metals have been primarily examined in relation to numismatics or with regards to the development of firearms in the late Sultanate. Minerals, as far as they have been discussed in scholarship, have been a peripheral topic in the study of agricultural practices, medicine, and alchemy. Using a variety of textual sources—encyclopedias, chronicles, and scientific treatises—this paper examines how Mamluk-era writers knew these resources in their context and as inanimate natural materials. It attempts to both expound upon available contemporary sources as well as situate this knowledge within Islamic cosmological, alchemical, and science-making practices. As part of an ongoing project exploring the knowing and making of metals and minerals in the Mamluk Sultanate, this paper lays a foundation for the further exploration of the topic, offering both first insights as well as consideration of avenues for continued study.

108. Getting Creative with Research and Funding: Tacit Knowledge Roundtable

Roundtable

2:00 to 3:30 pm - Saturday 15 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon A2

Sponsored by the Graduate and Early Career Caucus (GECC) This roundtable invites discussion on creative approaches to finding and applying to research opportunities. Current graduate students and early career scholars will speak on retooling HSTM topics for research and funding opportunities outside the field, applying to and utilizing digital fellowships and resources, locating and applying for funding outside of the United States, and building community-driven funding support within departments that bridge faculty and graduate lines. Participants will also share “tips and tricks” for best navigating archives and research institutions with limited resources.

Session Organizer:

Katherine White, University of California, San Diego

Participants:

Seán Thomas Kane, Binghamton University
Mary Kate Wolken, University of Minnesota

109. Knowing an Empire: Early Modern Spanish and Chinese Worlds in Dialogue

Roundtable

2:00 to 3:30 pm - Saturday 15 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon A3

How did scientific knowledge and imperial expansion evolve together in the early modern world? What did it mean for an empire to “know itself”? This roundtable rethinks the intertwined histories of empire and science. Challenging narratives that position the Chinese and Spanish empires as backward counterpoints to Northern European modernity, we frame them instead as sophisticated, knowledge-making entities deeply engaged with scientific inquiry into scale, diversity, and political authority. By juxtaposing the relaciones geográficas questionnaires of the Spanish world and difangzhi gazetteers of China, contributors show how bureaucratic documents create epistemic infrastructures, spaces where centralizing methodologies confronted local knowledge and where the ambitions and limits of state control became clear. Presenters will discuss comparative approaches to agriculture, diversity, ethnography, and natural resources. The Portuguese empire provides a revealing comparative lens as an “empire of outsiders,” characterized by informal and decentralized scientific practices, underscoring the constraints and complexities of formal bureaucratic science. This roundtable highlights fresh insights into comparative imperial science, innovative material and digital research methodologies, and the politics of information, advocating for a global history that moves beyond myths of exceptionalism.

Session Organizers:

Mackenzie Anne Cooley, Hamilton College
Dejinrah Couto

Chair:
He Bian, Princeton University
Participants:
Antonio Barrera-Osorio, Colgate University
Shih-Pei Chen, Max Planck Institute for the History of Science

110. Chemistries across Time
Contributed Paper Session
2:00 to 3:30 pm - Saturday 15 Nov.
Sheraton New Orleans: Napoleon B1
Participants:

On Golden Ground: Chymistry and the Comparative Political Ecologies of Soil in Early Modern Empires *Justin Niermeier-Dohoney, Florida Institute of Technology*

From Francis Bacon's notion of a "pure soil" which the English must seek for their colonial ventures to George Washington's paean to America as a vast continent encompassing "all the various soils of the world," early modern figures regularly wrote of "soil" as a metaphor for the complete environmental, ecological, or economic condition of potentially habitable territories. From the very beginning, the quality of a country's soil and the crops it could grow were often argued to be the most crucial aspect of any future colonial settlement. In the 16th and 17th centuries, numerous theories, practices, and material cultures emerged in European countries and their global colonial spheres to explain the fertility, degradation, and exhaustion of soils, and most importantly, how they might be chemically enhanced, preserved, or profitably exploited. This paper examines the confluence of chemistry, agrarian improvement, and settler colonialism by investigating how individuals involved in all these endeavors used knowledge about soils to assess the economic potential of imperial projects in early modern global empires. I examine three distinct examples of soil knowledge and the chymistry practices designed to enhance these projects: 1) The Obra de Agricultura (1513) of Gabriel Alonso Herrera, who argued that God had endowed Spain with universally fertile soil, making it the perfect agricultural laboratory for American crops, 2) debates between English colonial promoters Samuel Hartlib and Cressy Dymock on the chemical differences between soils in Virginia and Barbados, and 3) English physician Nehemiah Grew's experiments with soils to grow tulips at a scale to compete with the Dutch. Ultimately, I argue that chymistry became essential in the context of global imperial expansion due not just to its increased impact on the economics of empire but because it was an argumentative tool justifying the purposes (and costs) of imperial expansion.

Pulsing Radiowave, Flexing Molecule: Richard Ernst's NMR Research and Chemical Instrument-Model Coevolution, 1960-1980 *Ethan Ilhwan Kong, Department of Science Studies, Seoul National University*

Historians of modern chemistry have described chemists' adoption of digital instruments as the Second Chemical Revolution, in which Nuclear Magnetic Resonance (NMR) plays a pivotal role. Chemist-historian Pierre Laszlo even coined this transformation the "NMR Revolution," emphasizing how NMR revealed temporal and intra-molecular interactions to envision the dynamic molecular flexing. Nobel Laureate Richard R. Ernst (1933–2021), the inventor of Fourier Transform NMR (FT-NMR, 1967) in his postdoc at Varian Associates, Palo Alto, and two-dimensional NMR (2D-NMR, 1975) while a professor at ETH-Zürich, was at the heart of this transformation. Both techniques enhanced efficiency by applying radio pulses and mathematical processing, rather than the frequency-sweeping scan methods of earlier devices. Although procedurally similar, the differing motivations and conceptual origins of the two contingently emerged from the contrasting environments of engineering-driven Varian and academic ETH-Zürich. Examining Stanford and UC Berkeley collections on Varian, ETH's Ernst collection, and Ernst's publications including his autobiography, I

depict Ernst's research trajectory through Hans-Jörg Rheinberger's framework of "technical objects" and "epistemic things" interplaying in scientific practice. While Laszlo highlights how the NMR technology drove epistemic changes, I argue the reverse dynamic also operated: evolving molecular models, in turn, shaped the NMR design and function. Ernst's FT- and 2D-NMR research heavily used computers and mathematics and followed iterative steps of drawing, tinkering, and packaging, which exemplify the co-construction of instruments and models. My perspective on understanding Ernst's innovations extends Rheinberger's analysis and Gaston Bachelard's "phenomenotechnique" concept, bridging "the material" and "the ideal" in science.

An Evolutionary History of the Origins of "Green / Sustainable Chemistry" ***Mark A Murphy, Retired***

"Green / Sustainable Chemistry" involves the design and commercialization of industrial chemical processes and products that use and/or produce fewer toxic or dangerous chemical products or wastes which cause pollution or must be waste treated. For more than 25 years, a "narrative" has circulated very widely in the Academic and U.S. governmental literature, on the Internet, and in the popular Scientific press, that "Green Chemistry" had its origins in the 1990s at the U.S. EPA and/or in the "12 Principles of Green Chemistry" published in 1998. That "narrative" was and is wildly incomplete and/or deceptive. As early as the 1930s, chemists and engineers in the international oil refining and/or petrochemical industries began to semi-independently design, commercialize, and further evolve clean catalytic processes for making a wide variety of petrochemical products that generated very little waste or pollution. In the 1970s and 1980s, a variety of chemically related international industrial companies began to intentionally invent and commercialize products and processes that prevented waste and pollution, rather than clean them up "at the end of the tailpipe. The largely Academic "Green Chemistry" of the 1990s was actually a narrow subset of, and evolved from, the much earlier industrial "Pollution Prevention" efforts. In recent years the "Field" has greatly evolved and broadened, to embrace the more holistic concepts of "Sustainability" and "Systems Thinking". This paper will briefly overview the history of the people and inventions involved in that long-term evolutionary process.

111. After The Probabilistic Revolution Revolution

Roundtable

2:00 to 3:30 pm - Saturday 15 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon B2

It is now almost forty years since the publication of one of the most important edited volumes in the history of science: Lorenz Krüger, Lorraine Daston, and Michael Heidelberger's The Probabilistic Revolution (1987). The first volume concerned itself with the history of probability and statistics, explored across four parts. Part 1 interrogated the category of 'revolutions'; part two, on 'Concepts' dealt with the question of the meaning of probability and focused on the development of "ideas about uncertainty, chance, error, variation, freedom, and necessity"; part three examined examples of efforts to grapple with the problem of uncertainty in actuarial mathematics, measurement, and statistical inference; while part four—"Society"—was devoted to the examining efforts to "translate human experience into numbers." A myriad of papers and monographs flowed from the pens of those who contributed to the volume, marking a new era in the study of the social construction of scientific knowledge about probability and statistics. In this session, our aim is to reflect on the legacies of the Probabilistic Revolution as well as to survey some of the most interesting and novel developments in the history of statistics in the last few years. Six participants will be asked to offer 5-6 minutes of comments on one or more of the following questions before opening up the discussion to the audience: 1) What do you see as some of the most important legacies of The Probabilistic Revolution?; 2) What are, to you, the most important contemporary trends

within the history of statistics?; 3) Where do you think the field should go in the future?

Session Organizers:

Suman Seth, Cornell University
Arunabh Ghosh, Harvard University

Chair:

Theodore W. Porter, University of California, Los Angeles

Participants:

Tiago Saraiva
Jamie Budnick
Yi-Tang Lin
Sandeep Mertia

112. Give Me East Asia and I will Raise the History of Science: New Frameworks from Human, Capital, Cement, and Fish Swimming across Boundaries

Organized Session
2:00 to 3:30 pm - Saturday 15 Nov.
Sheraton New Orleans: Napoleon B3

This panel uses the regional specificity of East Asia not as a limiting frame but as a generative ground for rethinking the global history of science. Moving beyond established models of circulation, diffusion, trade, and localization, the papers collectively argue for new analytical frameworks that take East Asian histories seriously while intervening in broader theoretical debates in the field. Through regionally grounded case studies, the panel destabilizes dominant assumptions about the human, capital, materiality, and the category of East Asia itself. Yu Wang's paper on the standardization of occupational hearing loss interrogates how diagnostic norms travel globally while obscuring their cultural and political-economic origins. By comparing Chinese and Western paradigms of corporeal normativity, Wang questions what constitutes a "human" subject and how such definitions are calibrated through data and measurement. Framing science as a form of capital, Yang Li's paper on antibiotics reveals how the state's accumulation and redistribution of scientific capital not only reshaped the role of scientists under socialism but also reconfigured China's position within Cold War geopolitics. This framework bridges the history of science with political economic analysis, while uncovering a shared Cold War rationality of state-driven scientific accumulation across both capitalist and socialist regimes. Yuting Dong's paper turns to cement and dam-building in colonial Manchuria to rethink materiality in the history of technology. By following the concrete practices and labor politics of multi-ethnic workers, Dong complicates dichotomies such as West vs. non-West and colonial vs. indigenous, revealing the entangled politics that cemented the global trend of infrastructure building. Finally, Aijie Shi's study of reservoir-fisheries in the Cold War Pacific traces the geopolitical entanglements of aquatic science among socialist allies and their rivals. Challenging both the narrative of socialist bloc unity and the framing of East Asia as a bounded region, Shi proposes the Pacific as a non-teleological, decentered framework for reimagining global scientific exchange. Together, these papers invite a critical reorientation of the history of science—through bodies, capital, cement, and fish—by treating East Asia not as an exception to Western-centered narratives, but as a vantage point from which to theorize science in a deeply interconnected world.

Participants:

Data Gain, Deaf Gain: The Making of Occupational Noise-induced Hearing Loss in Post-Socialist China *Yu Wang, Cornell University*

Broadly defined, Occupational noise-induced hearing loss is a disease of partial or total hearing loss due to noise exposure in the workplace. Although the history of this disease predated the industrial revolution, it was not until the 1970s that Occupational Hearing Loss was officially recognized as a disease and disability with a diagnostic standard. The measurement of Occupational Hearing Loss reveals complex intersections between standardization and global knowledge hierarchies in defining the boundaries of the corporeal norm in modern societies. This research first traces the evolution of the standard to measure Occupational Hearing Loss, from Harvey Fletcher in the 1920s to AAOO in the 1950s and later ISO in the 1960s, demonstrating how technical measurements of disability are never purely scientific but deeply embedded in

political economy and power relations. It further signifies a process during which particular technologies of measurement were, in Lawrence Busch's term, naturalized as universal standards, obscuring their specific cultural and linguistic origins in the global North. Second, this presentation analyzes previously unexplored Chinese scientific reports on Industrial Noise Standards in the late 1970s and early 1980s. These sources, produced in the historical moment of China's transition to the post-socialist era, reveal how Chinese scientists negotiated between international standards and national conditions. In doing so, this research investigates the diverse political, medical, and industrial efforts that accompanied the construction of occupational hearing loss, unveiling the imbricated relations between the production of data and the calibration of the corporeal norm in a global context dominated by Western measurement paradigms.

Scientific Capital: A Critique of Science in Political Economy ***Yang Li, University of Wisconsin–Madison***

This paper reframes the relationship between science and society by introducing a new theory of "Scientific Capital." Drawing on Bourdieu's extended notion of capital and adopting a Marxian analytical framework, this theory integrates their strengths while addressing their respective limitations. To demonstrate its analytical power, I take science in socialist China—specifically antibiotic research and industry—as a case study. I argue that science functioned as a distinct form of capital that underwent a process of nationalization in early socialist China, paralleling the nationalization of private industry and commerce. The state systematically cultivated, nationalized, and redistributed scientific capital to build both an academic discipline and a modern pharmaceutical industry. This process not only enabled China to achieve independence from the Soviet Union but also deepened state control over science and industry. Meanwhile, for Western-trained Chinese scientists, their scientific capital became increasingly dissociated from their bodies, effectively transforming them from carriers of scientific capital into replaceable laborers. In other words, this process marked the proletarianization of scientists. Furthermore, the nationalization of scientific capital constituted a form of the state's socialist primitive accumulation. In the Cold War context, the development of the atomic bomb represented a key milestone in this accumulation, shifting Mao's political priorities from external conflicts to internal ones and setting the stage for the Cultural Revolution (1966-76). Finally, the perception of science as a form of state capital—and the competition for control over it—underscores a shared Cold War rationality across capitalist and socialist states, including the United States and China.

What Does Cement Tell us about History of Technology? ***Yuting Dong, University of Chicago***

Cement rose into a prominent building material in Japan's home islands and across its empire after the Great Kantō Earthquake in 1923. The use of cement both transformed traditional building style in Japan but also enabled Japanese engineers to collaborate with others in the global trend of large infrastructure building, notably dam constructions. This paper uses the Japanese dam building in Manchuria (currently Northeast China) as a case study to explore how the lens of material and materiality generates a new perspective to study the history of technology, challenging us to explore the dichotomy between West and non-West history of technology and science, to question how material history bridges the question between nature and culture, and to investigate the question of technology exchange. The dam I look at in this paper is the Hōman dam on the Songhua River, the largest river in this region. The design for the dam was drafted by Japanese

engineers with inspirations from American engineers and the building of the Hoover dam. However, the physical task of building the dam fell on colonial workers, among whom were both migrant workers and those later referred to as “slave labors.” These workers were mainly Chinese, but also Koreans and Russians. The multi-ethnic landscape of the dam building questioned posed a challenge for these Japanese engineers, who barely spoke the languages of the workers. Few workers had previous experience of working with cement. Their use and misuse of cement unveiled the political landscape behind infrastructure building.

Reorienting Reservoir-Fisheries in the Cold War Pacific: Aquatic Technology and Geopolitics within the Socialist Bloc and Beyond ***Aijie Shi, University of Wisconsin–Madison***

My research reexamines the mass construction of reservoir-fisheries during the geopolitical transition from World War II to the Cold War along the Pacific Rim. By utilizing artificial water bodies created by dam construction for aquaculture, this aquatic technology prompted a reassessment of inland water farming for productivity and national security. I focus on a pivotal scenario involving Chinese technocrats at the Wuhan Institute of Hydrobiology in the Chinese Academy of Sciences in 1965. Despite the construction of over 5,000 dams in the institute’s home province, a major debate persisted at the national freshwater research center regarding the establishment of its own reservoir-fishery station. My analysis juxtaposes this debate with the initiatives undertaken by the Northwest Pacific Fishery Committee to complicate the narratives of socialist bloc solidarity. While the Chinese technocrats collaborated with the Soviet Union, North Korea and North Vietnam to form a united socialist front for joint oceanic and inland water surveys across the West Pacific, they remained hesitant to fully transition from lake fisheries to reservoir-fisheries domestically. I further challenge the notion of reservoir-fisheries as a purely Soviet model by tracing their origins in Japanese colonization and their simultaneous development in Cold War America. Building on a multi-layered reexamination, I propose that the Pacific serves, in contrast to perspectives focused on the Orient, East Asia, and the Far East, as a non-teleological and non-centered diachronous analytical framework for reorienting narratives in the history of aquatic science throughout the twentieth century.

Session Organizer:

Yang Li, University of Wisconsin–Madison

Chair:

Fa-ti Fan, Binghamton University

113. Mind, Labor, and Movement: Metaphors in Histories and Futures of Communications Technologies

Futures Roundtable

2:00 to 3:30 pm - Saturday 15 Nov.

Sheraton New Orleans: Floor 3rd Floor - Napoleon C

The history of communications technologies abounds in metaphors: the printing press stood in for memory at work in the human mind; calculating human women loaned their titles to mathematical machines; finely knotted and draped thread or wire adorned women’s dress before we conceptualized trains, planes, and cell phones as items linked in networks. In the histories we write, and in our primary sources, these metaphors can reveal and obscure how technologies function within human systems. They can limn, in a given era, contested borders (and symmetries) between human and machine. They can seem to make contingent political and economic transformations into foregone conclusions. But perhaps most significant in our present moment, these metaphors can hide in plain sight the human labor that ensures “automated” communications systems function. This roundtable invites historians of science, the book, and information working across different periods and knowledge practices in Europe and the U.S. to bring their metaphors in for scrutiny: What sorts of metaphors do we use to conceptualize information’s past? What sorts of metaphors do our historical actors use, and how

do those metaphors shape their understandings of information and its uses and movements? What do these metaphors make visible? What do they hide? How have our uses of them changed over the course of the last thirty years as new information technologies continue to mutate? What possibilities does the past offer for metaphors that help us to make sense of these mutations and imagine the future of communications technologies? Metaphors of mind, material, memory, and movement have shaped the disciplines of book history, the history of record-keeping and archives, and of notation, data, and computing since their inception. They also often make legible the connection between communication practices past and present. Now, as these fields reckon with the increasing presence of large language model AIs, this session makes space for historians to consider how metaphors make meaning of that future, too.

Session Organizers:

Elizabeth Yale, University of Iowa
Melissa Reynolds, Texas Christian University

Chair:

Stephanie Dick, Simon Fraser University

Commentators:

Matthew L. Jones, Princeton University
Lauren Kassell, EUI/Cambridge
Nicholas Popper, College of William and Mary
Elizabeth Yale, University of Iowa

114. Futures Roundtable: Accessibility and the History of Science

Futures Roundtable
2:00 to 3:30 pm - Saturday 15 Nov.
Sheraton New Orleans: Floor 4th Floor - Nottoway

This roundtable explores the pressing question of accessibility within the field of the history of science, with a particular focus on academic conferences as both sites of scholarly exchange and potential barriers to feeling welcomed and at home. Despite growing awareness of the need for inclusivity, the structures and practices of academic events often remain inaccessible—whether due to financial constraints, physical and digital inaccessibility, language barriers, or assumptions about normative bodies, geographies, and institutions. Visa restrictions, risk of detainment and discrimination are intensifying barriers to scholars traveling to meetings held in the United States. Our discussion will aim to critically assess how the history of science, as a discipline, can become more equitable in both content and form. Contributors will reflect on their own experiences navigating these challenges, examine institutional responsibilities, and consider practical interventions for change—from hybrid and remote conferencing models to funding mechanisms and inclusive design. The round table will also address broader, reflexive questions, moving beyond best practices regarding accessibility, to ask: Who gets to produce and share knowledge in our field? Could histories of science be reshaped through more accessible and participatory modes of engagement? Recognizing that barriers to accessibility have an impact on who attends and participates, and that no one set of measures works for all, our roundtable will take place in two parts: First, as a virtual roundtable on Zoom on a suitable date before the annual meeting; and second as an in-person roundtable at the meeting where we will reflect upon and discuss issues raised during our initial session on Zoom. Organized by the HSS Committee on Diversity and Inclusivity.

Chair:

Dana Simmons, University of California, Riverside

Commentators:

Patrícia Martins Marcos, University of Oklahoma
Ayah Nuriddin
Isidro Nathaniel González, University of California, Santa Bárbara
Kate Jirik, San Diego Zoo Wildlife Alliance
Evelynn Hammonds, Harvard University

115. The Use and Abuse of Weather Data from the Early Modern Period

Roundtable
2:00 to 3:30 pm - Saturday 15 Nov.
Sheraton New Orleans: Floor 4th Floor - Oak Alley

Considering the fact of anthropogenic climate change, with the attendant desire for more detailed information from all sides of the political spectrum, the advances in digital imaging in the archives, and the changes in the relatively new science of historical climatology, many eyes are on old weather journals. Moving from tree rings to

text in response to Gordon Manley (c. 1950s), many data recovery projects have launched in the last couple of decades, with a variety of motivations from climate reconstruction to historical textual preservation. These data can be used by scientists and deniers alike, as the Industrial Revolution elides with theories about the Maunder Minimum, for example, as well as solar forcing and the notable effects of volcanic events in the 18th and 19th centuries. Where does the historian stand in all of this effort to decipher increasingly incomprehensible handwriting, recording the behavior of glass tubes of gas and fluids, and the movement of weather-vanes and clouds in the Early Modern period of meteorology, broadly construed (c. 1600-1900)? How do historians become engaged in this? And why do they, or should they? Is this antiquarian, or deeply political? Or both?

Session Organizer:

Brant Vogel, Independent Scholar

Chairs:

Fiona Williamson, College of Integrative Studies, Singapore Management University

James Rodger Fleming, Colby College

Participants:

Jin-Woo Choi, Princeton University

James McClure, Princeton University

116. Embodied Temporalities

"Futures" Roundtables

Futures Roundtable

4:00 to 5:30 pm - Saturday 15 Nov.

Sheraton New Orleans: Floor 4th Floor - Bayside ABC

Time is not merely an abstract concept—it is something that is lived, felt, and experienced through the body. Scientific, medical, and philosophical traditions throughout history have grappled with the relationship between bodily rhythms, timekeeping technologies, and the broader cosmological frameworks that structure the human experience. The history of science, while deeply engaged with the measurement and conceptualization of time, has yet to fully reckon with embodied temporality—the ways in which time can be conceptualized through biological, sensory, and material processes. This roundtable seeks to address this need by bringing together scholars from history of science, medicine, and ancient studies to explore how bodies have shaped and been shaped by time across different historical and cultural contexts. In particular, we ask how the study of the ancient cultures like those of Rome, Greece, and South Asia—including their medical traditions, philosophies of time, and timekeeping technologies—can inform contemporary discussions in the history of science. How did ancient thinkers conceptualize time as something physically experienced? What role did bodily cycles and medical theories play in shaping broader notions of time's passage? And how can non-linear or cyclical approaches to temporality challenge dominant historical narratives in science? With scholars who engage with historical sources ranging from Greek medical texts to ancient astronomical devices, from classical philosophical treatises to bodily metaphors in pre-modern science, this roundtable offers new pathways for exploring time as an embodied phenomenon. Panel Organizers: Kassandra Miller (Colby College) and Tejas Aralere (University of New Hampshire) Confirmed participants: Anna Bonnell Freidin (University of Michigan) Colin Webster (UC Davis) Anthony Cerulli (University of Wisconsin-Madison)

Session Organizers:

Tejas Aralere, University of New Hampshire

Kassandra Miller, Colby College

Commentators:

Anthony Cerulli, University of Wisconsin–Madison

Colin Webster, UC Davis

Anna Bonnell Freidin, University of Michigan

117. New Phases of Astronomy in the 19th and 20th Century

Contributed Paper Session

4:00 to 5:30 pm - Saturday 15 Nov.

Sheraton New Orleans: Floor 3rd Floor - Borgne

Participants:

The Dark Sides of the Sun: Early 19th Century Sunspot Observations and the Nature of the Central Star *Janna Katharina Mueller, University of Cambridge*

In 1816, the "year without summer," global temperatures plunged, leading to failed harvests and food shortages, a series of events that is now attributed to the 1815 eruption of the volcano Mount Tambora.

This episode has therefore primarily been studied within histories of meteorology and earth sciences. In 1816, there was, however, another possible explanation investigated. Some English and German astronomers sought the cause for low temperatures in the heavens: observing a slightly higher number of sunspots during the summer of 1816, they speculated about a potential link between solar activity and Earth's cooling. This paper will examine sunspot observations and theories of their impact during that period. While sunspots had been observed for centuries, their interpretation varied from strange bodies orbiting the sun or swimming on its surface to being actual physical features of the sun itself. Analysing these later interpretations of the early 19th century reveals not only how astronomers of that time envisioned the Sun's structure, composition, and development, but also provide a case study to their understandings of the mechanisms of its heat and light and the solar influence on terrestrial phenomena. Furthermore, it highlights how pre-spectroscopic astronomy, traditionally focused on positional studies and celestial mechanics, began to adopt a more 'physical' approach, delving into the nature of celestial bodies as well as applying contemporary physical knowledge to the heavens.

The Haunted Astronomer: Camille Flammarion's Psychical Research and Uranian Philosophy ***Matthew Shindell, Smithsonian National Air and Space Museum***

In the history of astronomy, Camille Flammarion (1842-1925) has been understood as a popularizer and an advocate of the plurality of inhabited worlds whose ideas were influenced by his involvement in Allan Kardec's spiritist movement. However, although Flammarion began as one of Kardec's acolytes and did incorporate spiritist ideas into his first works on plurality, he quickly moved away from one of spiritism's core principles—that séances put participants in contact with spirits. Flammarion instead moved into psychical research and became a leading voice in the pursuit of natural explanations for psychical phenomena. He did this with the belief that the findings of psychical research would form a new branch of physics. In his later writings, and particularly in his novels Lumen (1872), Urania (1889), and Stella (1897), he combined his dual commitments to psychical research and plurality into a philosophical viewpoint regarding the place of humanity in the universe. The "Uranian life," described in these works through the imaginative exercise of fiction, invited Flammarion's readers to see his vision of the unity of the immortal human soul and the intelligence of the infinite universe. A proper understanding of Flammarion will see him not merely as a popularizer or pluralist, but as a modern thinker engaged in a project of cosmopoesis.

Science and Colonization in the Middle East: Colonial Science at the Ksara Observatory, 1907-1925 ***Thomas McLamb, University of California, San Diego***

In 1907, the Jesuit Universite Saint-Joseph in Beirut, Lebanon established an astronomical observatory at Ksara, Mount Lebanon. The French consul in Beirut, Francois Georges-Picot, supported the observatory materially and politically. He connected the observatory staff with wealthy industrialists and fellow imperialists who hoped to acquire Syria and Lebanon as new colonies. Georges-Picot hoped to use Ksara's meteorological, seismological, and geographic data to quantify the value of Syria and Lebanon as potential colonies. Ksara's relationship with Georges-Picot thus informed his economic view of the secret Sykes-Picot agreement which partitioned the Middle East into French and British colonies. While historians in recent years have documented the economic motivations behind many Third Republic observatories, Lewis Pyenson argued that the exact sciences, especially those at Ksara and other astronomical observatories, were isolated from

economic and colonial motivations. The proposed paper asks whether recent findings on the political economy of French observatory sciences calls into question the supposed isolation of Ksara from French colonial rule. Implicated so heavily French colonial ambition, the work done at the Ksara Observatory demonstrates how economic motivations altered the observatory sciences in a colonial setting. Ksara's records implicate the observatory in pre-colonial espionage, the Sykes-Picot agreement, military intelligence-gathering, and repressive campaigns against the Syrian peasant communes, all conducted with scientific instruments provided by Georges-Picot, the French government, and wealthy industrialists who supported Ksara. The proposed project hopes to demonstrate Ksara's techniques and instrumentation were not neutral or isolated, but informed by and implicated in French colonization.

118. Knowing Ancient Mesopotamia

Contributed Paper Session
4:00 to 5:30 pm - Saturday 15 Nov.
Sheraton New Orleans: Edgewood

Participants:

Agents and Instruments of Archaeological Fieldwork at Nippur ***Amber Zambelli, University of Pennsylvania***

In 1898, the University of Pennsylvania began its archaeological campaign at Nippur, in the Ottoman Vilayet of Baghdad, making history as the first expedition to the so-called Near East by an American university and the cause for establishment of the Penn Museum. Dismissed as a failure by the team when compared against subsequent seasons that yielded a far greater volume of cuneiform tablets and other valuable material culture for the Museum, this first campaign nevertheless remains instructive for understanding social and technical landscapes of archaeological fieldwork at the turn of the twentieth century. This paper reexamines the expedition archives to attend to matters of sociability, boundary work, and instrumentalization of laboring bodies in archaeological practice. In it, we explore dynamics of knowledge production and expertise among three categories of actors: the Euro-American expedition members, University leadership, and Philadelphia intelligentsia who underwrote the Babylonian Exploration Fund; the labor force consisting of 300 unnamed Arab men and boys hired from the vicinity of Nippur; and the expedition's Armenian dragoman Daniel Zado Noorian, described by an expedition member as "almost an Arab himself," and whose contingent identity positioned him as both a professional and racial interface between the two groups. This study offers insights into how embodied labor by racialized workers at Nippur was conceptualized, quantified, and elided in the production and publication of archaeological knowledge within the nascent discipline of Near Eastern archaeology as practiced in the United States.

A Scribe's Burden: The Epistemic Adventure of an Ancient Middle Manager ***Robert Middeke-Conlin, Max Planck Institute of Geoanthropology***

Change can be hard. Well, at least noticing change can be hard for the historian of ancient Mesopotamian science. This is because the Mesopotamians seldom discuss change, or really any knowledge, let alone any science. They left behind a lot, but they seldom left their thoughts. And so, we only see epistemic change after the fact. This presentation isolates a moment when change occurred: a period of weeks during the mid-Old Babylonian period (Southern Iraq between 1800 and 1700 BCE). The change occurred in an unknown municipality. It was made by an unknown scribe, a middle manager administering brick deliveries. The change is small, very hard to notice. But this change reflects of a seismic shift in mathematical reasoning that preceded and went on around our industrious administrator. Why did this administrator inaugurate his change? What kinds of cognitive leaps did this middle-manager make that lead to it? This presentation will tell the story of an ancient

administrator's approach to problem solving in a time of epistemic transformation.

Corroborating Cuneiform: Archaeological Matters of Fact in Victorian Britain
Faridah Laffan, Cornell University

In 1857, four Victorian "biblical archaeologists"—scholars who excavated ancient near eastern materials to historicize Biblical narratives—held a translation contest. Unconcerned with hierarchy or credit, this was a contest of confirmation, the winner the burgeoning field: the quartet hoped to verify that they had solved the problem of cuneiform decipherment. Separately translating the same passage and sealing their work in envelopes to be opened at the Royal Asiatic Society, these scholars sought matching translations, their independent duplication theoretically proving that philological study could produce reliable knowledge about Mesopotamian antiquity. Cuneiform decipherment was shaped by problems of standardization, replication, and duplication, from transferring concave cuneiform to paper, to defining persuasive rules of translation. Steven Shapin and Simon Schaffer have theorized various literary technologies that 17th-century experimentalists used to make truth claims (Leviathan and the Air-Pump, 1985). My paper shows a non-experimental discipline inventing new material and intellectual literary technologies which shaped one another as scholars used them to historicize the Bible. Biblical archaeologists commissioned new founts that could print cuneiform letters interchangeably with roman letters. Their flexibility encouraged scholars to show their work word for word and thereby challenged colleagues to check it, iteratively confirming decipherment theories while simultaneously uncovering new information about Mesopotamian pasts. The translation contest brought philologists together to form a discipline whose new literary technologies emerged hand in glove. Its story pulls together histories of science, technology, and art to show how literary technologies—rather than ones centering excavation—shaped productions of biblical archaeological fact.

119. Ecologies of Exposure: The Mississippi Delta

Roundtable
4:00 to 5:30 pm - Saturday 15 Nov.
Sheraton New Orleans: Napoleon A1

Inspired by recent approaches in historical geography, political ecology, and environmental history, this roundtable seeks to explore not only how the logics of exposure have become an integral component of environmental knowledge; by involving experts on the Mississippi Delta region, it also aims to activate conversation about how communities and social actors, past and present, have understood, withstood, or countered the material distributions and legacies of exposure within the environs surrounding this year's HSS meeting. In doing so, it embodies a relational sensibility attentive to the complex entanglement of material vectors, elemental forces, and systems of multiple kinds. Participants will address how the knowledge and action of ecosystems, bureaucratic regulatory regimes, plantation economies, petrochemical infrastructures, medical understandings of health and climate, the logics of historical preservation, and modes of collective memory-making intersect with the deep histories of political and social stratification that characterize the region. Rather than positing natural processes or social structures as a priori determinants in ecologies of exposure, panelists will share how they combine various methods, such as ethnographic narrative, material analysis, GIS mapping techniques, and archival research, in order to unearth how more-than-human agencies become intertwined with anthropocentric legacies within materializations of exposure. Through this locally-grounded focus, our roundtable discussion will bring experts on the region from multiple disciplines into conversation with fellow colleagues visiting New Orleans to sketch out new trajectories, theories, and methods for understanding how both social histories and histories of science shape, and are shaped by, emergent as well as enduring ecologies of exposure.

Session Organizer:

Sam Hege

Chair:

Cynthia Browne, Max Planck Institute for the History of Science

Participants:

Shannon Lee Dawdy, University of Chicago
Scott Frickel, Brown University
Elaine Lafay, Rutgers University - New Brunswick
Kathryn Olivarius, Stanford University
Ashley Rogers, Whitney Plantation
Leila Blackbird, University of Chicago

120. Women's Mentorship Event

Roundtable
4:00 to 5:30 pm - Saturday 15 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon A2

Abstract: Join our informal conversation on the theme of resilience. In this session, grad students/early career scholars and more established scholars can discuss the challenges faced by women in academic careers. This is a space to share experiences and suggestions for thriving within the university. All non-binary and women-identifying attendees are welcome.

Session Organizer:

Katherine White, University of California, San Diego

Chairs:

Mary Kate Wolken, University of Minnesota
Claire Ann Votava, University of California, Los Angeles

Participant:

Ellie Louson, Michigan State University

121. Scientific Internationalism: What Might the Past Tell Us about Our Present Moment?

Roundtable
4:00 to 5:30 pm - Saturday 15 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon A3

Scientific internationalism matters greatly to the practice of modern science. Since the 1930s, when sociologist Robert K. Merton formulated his four norms of scientific research—CUDOS: Communality, Universalism, Disinterestedness, and Organized Skepticism—historians of science have explored universal commitments and elite practices in the global scientific community. Allied scientists boycotting German scientists after World War I; the out-migration of German Jewish scientists after Hitler's rise; Soviet withdrawal from international scientific unions from the late 1930s to the mid-1950s; the strategic use of internationalism for scientific intelligence-gathering during the Cold War; the occasionally fraught execution of multinational efforts including the International Geophysical Year—we can now tell stories about all these issues. Recent global developments give new poignancy to these twentieth century episodes. Heightened tensions have limited US-Chinese scientific and data exchanges; Western nations curtailed Russian participation in international scientific activities after Russian leader Vladimir Putin launched an invasion of Ukraine in 2022; and following Donald J. Trump's inauguration as president in January 2025, the US has withdrawn from the World Health Organization and restricted the ability of scientists in US federal agencies, such as the National Oceanic and Atmospheric Administration, to travel to international meetings or to share data with foreign colleagues; diminished research funding and the threats to universities in the US is inspiring out-migration. How similar, and how different, are these developments from those in the prior century? What insights can be gained by revisiting crucial earlier episodes? What new questions should be asked? Participating scholars in this roundtable have addressed scientific internationalism in various national contexts in their own work and anticipate lively discussion with interested HSS members.

Session Organizer:

Ronald Doel, Florida State University

Participants:

Elena Aronova, University of California, Santa Barbara
Yangyang Cheng, Yale University
Fujio Ohnishi, Hokkaido University
Urban Wrakberg, Arctic University of Norway at Kirkenes

122. From Trust to Crisis: Scientific Credibility and Institutional Legitimacy in the 20th Century

Organized Session
4:00 to 5:30 pm - Saturday 15 Nov.
Sheraton New Orleans: Napoleon B1

Science and technology can contribute to

legitimization. This is reflected in the recognition that the results of Soviet science helped to legitimize Soviet political actors and the Soviet project more broadly (Adams 2001; Gerovitch 2011; Gill 2011). An especially vivid demonstration of this comes from Kendall Bailes' (1976;1978) classic case-study on how the achievements of Soviet aviation were used by Stalin to legitimize his rule in the 1930s. The historical resources on science and (nondemocratic) political legitimization remain however unexploited in philosophers' theoretical discussions concerning science, credibility, and legitimacy. The aim here is to establish a firmer link between philosophical accounts on the above themes and the works of historians, with a special focus on Soviet chemistry. The salience of science for political legitimacy is demonstrated by examining more closely Nikolai Semenov's work on branched chain reactions. Semenov is known as the first Soviet scientist to become a Nobel laureate, but less known is that he issued his theory as a response to a crisis of scientific credibility. Examining this trajectory reveals how issues of scientific credibility can lead to results that ultimately help to legitimize the broader political project, which is helpful for the theoretical goal of mapping how outputs of science can lend political legitimacy.

Participants:

A Scientist for President! Science, Politics and New National States After the World War I ***Jan Jakub Surman, Masaryk Institute and Archives of the Czech Academy of Sciences***

The first decade of the interwar period in East-Central Europe was a time of building post-imperial nation-states. Scholars and scientists were at the forefront of state-building, both as intellectuals who lent legitimacy to the new systems and, quite often, as heads of state. In Czechoslovakia, the philosopher Tomáš Garrigue Masaryk was elected president in 1918; in Poland, Gabriel Narutowicz (professor of hydroelectric engineering) was elected in 1922; one of his main opponents was the linguist Jan Baudouin de Courtenay; the president of the Central Council of Ukraine (de facto president) was the historian Mykhailo Hrushevsky. While their political credibility came from a variety of sources, being an academic was one of them - associated, for example, with ideals of objectivity, impartiality, and being a non-chauvinist, internationally-minded patriot (important especially in multinational Poland and Czechoslovakia). In my presentation, I will discuss the figure of the scholar as an important resource for strengthening the legitimacy of new states in East Central Europe. Focusing especially on Narutowicz and Masaryk, I will argue that their virtues as scholars were crucial for their political careers, but also served to discuss and partially redefine both politics and scholarship in both countries, as well as the relationship between the two spheres. Finally, I will discuss how science and its credibility were addressed in their popular images, both those produced by state propaganda and from a "bottom-up" perspective.

Epistemic Arbitrage and Scientific Authority: Science Popularization in the Cold War Soviet Union ***Alexey Golubev, University of Houston***

This paper addresses the Soviet scientific literacy campaign (1947–1991) as a form of epistemic arbitrage—a practice where actors leverage differences between knowledge systems to produce value. The Soviet campaign built an extensive infrastructure for public communication of knowledge, including planetariums, museums, and lecture venues, and relied on the Society for Dissemination of Political and Scientific Knowledge (Znanie after 1963) to maintain scientific authority in the USSR. However, the campaign operated in a highly contested field, facing pressure from transnational and domestic actors who challenged Soviet knowledge claims. My central concept—epistemic arbitrage—derives from social studies of economic arbitrage, where profit emerges from navigating between markets with differing valuations of the same asset. Applied to knowledge, arbitrageurs exploit differences in epistemic systems to reclassify knowledge as true or false,

original or imitative. In the Soviet context, actors of epistemic arbitrage included Western broadcasters like Radio Free Europe / Radio Liberty, domestic critics such as advocates of genetics during the Lysenkoist era, and religious groups. These actors highlighted contradictions in Soviet knowledge claims, undermining the authority of official science popularizers. Despite the Party's centralized control and Marxist-Leninist ideology asserting the superiority of socialist knowledge, Soviet knowledge popularizers consistently referenced critical assessments of Soviet science. The paper argues that this dynamic—both the real and perceived pressure from epistemic arbitrage—shaped the Soviet system of science popularization, making the field of public communication of science simultaneously an assertion of socialist scientific authority and a response to external and internal challenges.

Broken Instruments: The Fragmentation of Science Diplomacy during the 1968 Czechoslovak Crisis ***Doubravka Olsakova, Faculty of Social Sciences, Charles University, Prague***

This paper explores the 1968 Warsaw Pact invasion of Czechoslovakia as a pivotal moment that exposed the fragility of science diplomacy and the contested nature of institutional trust in science. Building on theoretical frameworks that conceptualize trust as a relational and performative construct (Shapin, 1994; Luhmann, 1979), the study interrogates how scientific authority—often mobilized to legitimize political institutions—can rapidly fracture under geopolitical duress. Science diplomacy, typically framed as a stabilizing force in international relations, depends on the perceived neutrality, credibility, and transnationalism of scientific communities. Yet, in moments of political crisis, these assumptions collapse. The 1968 occupation disrupted the epistemic foundations of trust between scientists, states, and international organizations. Czechoslovak scientific institutions were swiftly restructured under the ideology of "normalization," and dissenting scholars were purged in the name of ideological conformity, revealing how science could be appropriated as a tool of political legitimation rather than objective inquiry. The Pugwash Conferences on Science and World Affairs, which sought to foster East-West scientific dialogue, became a contested site of credibility. While some Czechoslovak scientists viewed Pugwash as a potential space for resistance, others—particularly Soviet participants—used it to reinforce regime narratives. The resulting tensions within Pugwash reflect deeper paradoxes in the role of science diplomacy: it aspires to universalism, but remains vulnerable to national instrumentalization. Through archival records, correspondence, and institutional documents, this paper argues that the 1968 crisis reveals how trust in science is not only a cultural achievement but also a political battleground, subject to erosion in moments of institutional rupture.

Science, Technology, and Legitimization: Towards a Broader Understanding of Nondemocratic Political Legitimacy ***Karoliina Pulkkinen, Aleksanteri Institute, University of Helsinki***

Both historians and philosophers of science have expressed an interest in mapping how science and technology relate to political legitimacy. For example, among historians, the idea that Soviet politicians sought to legitimize their rule or their mode of governance emerges frequently in the secondary literature as does the recognition that science and technology played a role in such processes of legitimization (e.g., Bailes 1976;1978; Gerovitch 2011:460; Gill 2011; Adams 2001:269; Holloway 2008:577). Among philosophies of science, many propose that democratic input can legitimize the influence of scientists' values that impact research (Intemann 2015; Elliott 2017; Parker & Lusk 2019; Lusk 2020, 2021). In this talk, I will especially argue that philosophers' normative approaches benefit from more explanatory accounts informed by histories of science and

technology. In particular, closer attention to Soviet histories shows that science and technology can help to legitimize regimes, as evidenced by Kendall Bailes' (1976;1978) classic case study on Soviet aviation in the 1930s. Building on Bailes' work, I offer two explications on the role of science and technology in legitimization. First, the achievements of research can be co-opted into legitimization. Second, researchers may be incentivized to contribute to outputs viewed important for politicians, which can further legitimize political rule. All this points towards how philosophers need to keep output-oriented theories of political legitimacy on board for a fuller grasp on political legitimacy and its relationship with science and technology.

Session Organizers:

Jan Jakub Surman, Masaryk Institute and Archives of the Czech Academy of Sciences
Doubravka Olsakova, Faculty of Social Sciences, Charles University, Prague

Chair:

Jan Jakub Surman, Masaryk Institute and Archives of the Czech Academy of Sciences

123. Knowledge Economies

Organized Session
4:00 to 5:30 pm - Saturday 15 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon B2

Economists and social theorists beginning in the mid-20th century envisaged an emerging "knowledge economy" that would supplant the centrality of industrial production through the widespread adoption of information processing technologies in US society. While often treated as a fantastic or problematic metaphor, this panel instead analyzes imagined and real changes in the US economy to characterize how and in what ways "knowledge economies," "knowledge production," and "knowledge work" became real. Our papers examine imagined transformations in US capitalism centered around the widespread use of computing technologies, the real application of computing technologies to business problems, and the way that the production of science itself came to be reorganized in the last decades of the 20th century. By bringing together these perspectives, we aim to begin to bridge the gap between political economy, the history of capitalism, and the history of science.

Participants:

The Invention of the Theoretical Sciences ***Julia Harriet Menzel, Massachusetts Institute of Technology***

Over the last fifty years, a new order of scientific disciplines has begun to displace more familiar groupings like the "natural sciences" as a way of organizing, funding, and instituting scientific research. This talk offers reflections on the history of the "theoretical sciences": a formation which draws together theoretical physics, mathematics, computer science, and all manner of "natural" and "social" sciences of a quantitative and computational bent. Concretely, it locates the origins of this category in the mid-1970s, examining a loose movement led by theoretical physicists to create a new world of "flexible" and "interdisciplinary" institutions for theoretical research outside the "bureaucratic" structures of the Cold War university, often with the help of philanthropic and corporate patronage. With the aim of connecting changes in the order of the sciences to changes in the late-twentieth century social order more broadly, this talk follows a chain of institutional influence that leads from the Aspen Center for Physics—a utopian summer retreat for theoretical physicists hosted on the grounds of a prominent "third way" think-tank—to new theoretical and mathematical institutes in the United States and Britain, "transdisciplinary" initiatives like the Santa Fe Institute, the arXiv preprint server, and (more recently) the Simons Foundation. More conceptually, it asks whether a traditional order of the sciences defined by the objects of scientific knowledge may be giving way to a new order that groups the sciences by their techniques and methods of understanding.

The Nature of the Problem: Computational Complexity from Factories to Theoretical Computer Science 1954-1976 ***Devin Kennedy, University of Wisconsin***

Theoretical computer science is concerned

with the analysis of abstract computational "problems" in terms of their characteristic difficulty. While the work of Alonzo Church and Alan Turing (1936) on the limits of computation is well known, the continued study of the difficulty of computational problems after the invention of the electronic computer, is less well known, including during the early era of early work between the 1950s and 1970s which culminated in the conceptualization of the famous 'P versus NP' problem. This paper introduces a new project on this history, focusing on the early, practical context of research in the 1950s and the ties between computational complexity theory and operations research. It focuses on one particular problem, the job-shop scheduling problem (JSP), which asks to determine in advance the best schedule for a set of workers and machines in a custom parts factory. This was an eminently practical problem for computer researchers looking to develop industrially useful algorithms for the manufacturers investing in computing machines. It also turned out to be an incredibly challenging problem that forced new thinking about the study of algorithms and the nature of computational difficulty. This paper follows JSP from the 1950s until 1976 (when it was shown to be NP-Complete) to understand the broader context, concepts, and practices of theoretical computer science during an important, early period. It also sheds light on the disciplines and people involved in early computer science.

The Manifest Destiny of Computing ***Stephanie Dick, Simon Fraser University***

In 1983, Edward Feigenbaum - computer scientist and founder of the "expert systems" approach to artificial intelligence - and Pamela McCorduck - a popular historian and writer - published The Fifth Generation: Artificial Intelligence and Japan's Computer Challenge to the World. In it, they propose that computing had a "manifest destiny" to become central in our lives and to "be intelligent, by whatever definition you prefer". At the heart of their vision was a belief that computer-based knowledge - reimagined in the context of "expert systems" design, as a body of programming rules - would be at the heart of a new economy and a new "wealth of nations". Like settler colonial "manifest destiny", expert systems was explicitly an exercise in extraction - seeking to get knowledge out of human experts and into automated databases, making it more cheaply and readily available. This was done within a framework of "democratizing" access, but in fact, primarily served the needs and aims of a growing managerial class in the knowledge economy of the late 20th century. The U.S. Airforce, in introducing approaches to expert systems development hoped "that this survey will be useful to … busy managers who want to be certain they have selected the best tool for the important job of knowledge extraction" (1990). This talk explores the theory of knowledge at the heart of expert systems development, and the knowledge extraction practices that fuelled it by drawing on defense establishment surveys, popular writing, and practical attempts to develop expert systems in domains from mathematics to oil and gas exploration.

Knowledge Economies or Knowledge Capitalism? ***Sam H Franz, History and Sociology of Science, University of Pennsylvania***

Claims about the coming importance of computing turned on questions of an "information revolution," nascent "knowledge economy," or "post-industrial society." This paper investigates the history of such claims centrally through the economic thought of Fritz Machlup, an Austrian economist credited with investigating and popularizing such language. Writing in the 1950s and 1960s, Machlup's economic work attempted to characterize the economic function and utility of knowledge production using the statistical tools of national accounting and political arithmetic. Machlup navigated contemporaneous theories of human capital, productive and unproductive labor, and early understandings of knowledge

work in order to claim that knowledge would become increasingly central to US economy in the second half of the 20th century. This presentation historicizes and critiques Machlup's framework through analysis of "productive" labor and real abstraction, drawing on Marxian histories of technology and labor process. I then briefly turn to the way that Machlup's work influenced university administration and management, suggesting that a history of the rise of the "knowledge economy" can help us understand current political debates about the function of universities in US social and economic life.

Session Organizer:
Sam H Franz, History and Sociology of Science, University of Pennsylvania
Chair:
Cathy Gere, History

124. The China Boxer Indemnity Program (1909-1944) and China US PhD Application Programs (1979-1989)
Organized Session
4:00 to 5:30 pm - Saturday 15 Nov.
Sheraton New Orleans: Napoleon B3

One of the distinguishing features of the contemporary Chinese academe is the long-standing importance of overseas training and study, especially at the post-tertiary level, and especially in the US. This largely occurred in two waves. First, between 1909-1944, 1,417 Chinese Boxer Indemnity Scholarship students studied in the US, of whom over 300 earned a PhD degree, and 600 a terminal MSc or equivalent degree. Second, between 1979-1989, 1,662 Chinese students enrolled in US PhD programs in Physics, Biochemistry, Chemistry, and Math selected and funded largely by US professors and programs of study. However, while the impact and importance of the first wave is well known and better studied, the impact and importance of the second wave is less well-known and hardly studied at all. This then is the motivation for the proposed panel comparing the 1,417 Boxer Indemnity Scholarship students and the 1,662 China-US PhD Examination and Application Program (CUS-PhD-EA) students in Physics (915, CUSPEA), Biochemistry (418, CUSBEA), Chemistry (243, CGP), and Math (86), 1979-1989. These Chinese students were among the first ever to complete post-tertiary scientific training. However while all the Boxer students returned to China, two-thirds of the CUS-PhD-EA remained in the USA. Many students regardless of their final location made important contributions in their respective scientific fields. This was especially true of the CUS-PhD-EA student who also contributed to a new model of industrial-academic cooperation which has already transformed the academe from a remote academic Arcadia to an entrepreneurial Launch Pad of innovation and economic growth. Indeed, half or more of these Chinese PhDs currently work in the US and China and continue to make important contributions to the semiconductor, biotechnology, financial technology, and information technology industries where 20 percent are Founders/Co-Founders or VPs of global scientific companies, as well as universities and research laboratories where 20 percent are academicians, named chair professors, or senior academic administrators.

Participants:

Family Origins, Education, and Employment of Chinese Boxer Indemnity Students, 1909-1946 ***Chen Liang, Nanjing University***
This paper summarizes research on a dataset of all 1417 Chinese Boxer indemnity students, 1909-1946 including their family origins, education in China and the USA, and employment in China. We compare students studying in pure and applied science with those studying in other fields. Moreover, we also compare students by gender, family occupation (when available), and place of origin.

Family Origins and Education of China-US PhD Examination and Application Program Students in Physics, Biochemistry, Chemistry and Math, 1979-1989 ***Shengbin Wei, Hong Kong University of Science and Technology***
This paper analyes a database of 1,662 China-US PhD Examination and Application Program Students in Physics, Biochemistry, Chemistry and Math who enrolled in respective US disciplinary PhD programs focusing on their gender, family origins, and prior education in China and

their education in the USA. In terms of family origins, I distinguish between parental occupation and parental education as well as place of origin and household registration status. In terms of prior education in China I identify both their place and dates of secondary as well as tertiary education. In terms of education in the USA I identify both the initial PhD disciplinary program which accepted these students and the discipinary program from which they eventually graduated.

Initial and Current Employment of China-US PhD Examination and Application Program Students in Physics, Biochemistry, Chemistry and Math ***Dongqian Liu, Hong Kong University of Science and Technology***

This paper analyzes a database of 1,662 China-US PhD Examination and Application Program Students in Physics, Biochemistry, Chemistry and Math who came to the USA between 1979 and 1989, and focuses on their initial and current employment. I distinguish both between those students working in China and those working in the USA, as well as those working primarily in the academe or primarily in industry. I focus in particular on the 20 percent of those CUS-PhD-EA graduates working in industry who became founders/co-founders or VPs of important scientific companies and another 20 percent of these students working in the academe who became academicians, named chair professors, or senior academic administrators in universities and research laboratories.

Professional Education and Employment in China: Health and Engineering, 1905-1952 ***Bamboo Ren, Hong Kong University of Science and Technology***

This paper draws on individual-level data from the China University Student Datasets and the China Professional Occupation Datasets to analyze the educational backgrounds, career trajectories, and social origins of over 24,000 health professionals and medical students alongside 65,000 engineers and engineering students including a number of Chinese Boxer Indemnity students. I demonstrate that while medical professionsls were initially largely trained in missionary medical schools and work in missionary medical hospitals, engineers were educated in public universites and employed by the state. These distinct pathways also underlie key differences in social and spatial origins, education oppportunities, and career prospects overlal as well as by gender. By integrating institutional history with a big data approach I provide new insights in the porofessionalization of medicine and engineering in the first half of the twentieth century and its lasting impact on these professions today in mainland China and Taiwan.

Session Organizer:
James Lee, HKUST

Chair:
James Lee, HKUST

125. Sexing Sciences, Sciencing Sex

Contributed Paper Session
4:00 to 5:30 pm - Saturday 15 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon C

Participants:

Against the "Tyranny of the Calendar:" Sexology, Gerontotherapy, and Harry Benjamin's Biological Age Estimation ***Ben Maldonado, Harvard University***

This paper explores one of the earliest articulations of biological age estimation through its measuring methods and biopolitical aspirations. In 1947, German-American physician and endocrinologist Harry Benjamin, better known for his work on transsexuality, published his method for biological age estimation in the Journal of Gerontology, the first of its kind. Drawing from published and archival material, I argue that Benjamin developed a practice of biological age estimation to demonstrate the efficacy of "gerontotherapy", a term he coined in the 1940s as a scientific refashioning of glandular rejuvenation after it increasingly fell under critique by medical

authorities as quackery. Further, I argue that Benjamin framed biological age as a biopolitical tool through which to organize social institutions and address social problems, ranging from retirement policy to the legalization of prostitution to the outcomes of diplomacy and war. This, I suggest, constituted a type of gerontotherapeutic vision of the future: a world in which the medical treatment of aging and widespread usage of biological age estimation both revitalized individual health and maintained a vigorous and prosperous nation. In conversation with the scholarly literature in trans history about Benjamin as a key figure in trans medicine, my examination of Benjamin's gerontotherapeutic practice reveals the historical interactions between the disciplines of gerontology and sexology through the nexus point of biological age estimation.

Unlikely Allies: The Effects of Shifting Public Sentiment on Endocrine Research during the Interwar Period ***Silvia Basanta, Konrad Lorenz Institute***

A unique concurrence of scientific mindset and cultural modernism made Vienna's fin de siècle (1867-1918) a hotbed for the scientific study of sexuality, until popular antagonism and state suppression turned against the discipline towards the end of the first Austrian republic (1919-1933). In this paper, I investigate the gland transplantation experiments conducted by Eugen Steinach (1861-1944) and Ludwig Haberlandt (1885-1932) during the nineteen-twenties that led to the postulation of unconventional hormone effects including sexual plasticity, hormonal contraception, and "rejuvenation" procedures. Following their personal and interpersonal accounts, I reveal insight into how they strived for intellectual independence and decided to undertake the next steps of their empirical research despite reactions in the popular imaginary of the time. History of science often focuses on small-scale social networks - families, university departments, or research groups such as the Vienna circle. Here, I explore some unexpected parallelisms between these two researchers despite their different backgrounds and institutional contexts, including those that derived from their choice to shift their career focus to hormonal research, and elaborate on how they were subjected to larger society trends. I use these two case studies to reveal the role that the science of sex played amidst cultural and national anxieties, as well as the struggle of scientists between personal aspirations and public sentiment during the 1920s.

Whose Body, Whose Rules? Binary Bias and the Making of Trans Surgical Standards ***Madalayne Elise Martin-Olenski, University of Rochester***

Published in 1979, the first official Standards of Care for transgender people ushered in a new era of accessibility and interest in transgender medicine in the United States. With new guidance and research interests piqued, physicians adopted these standards in their own practice. However, many physicians also continued to rely on their own binary gender norms as legitimate diagnostic criteria, allowing subjective goals to guide the evolution of vital gender affirming procedures and sharply curbing who qualified for care. Focusing on the field of urology, this paper maps the advent and evolution of gender affirming "bottom" surgery by analyzing patient-facing procedure fact sheets, trans community communications regarding surgical options, and interviews with trans patients currently navigating the world of transition surgeries. This analysis suggests assumptions about patients' marital status, race, and mode of intercourse, among other factors, crept into urologic care options for trans patients. Specifically, physicians used these factors to disqualify certain "undesirable" patients and skewed procedure outcomes in favor of their own goals instead of the patient's. This ultimately contributed to modern distrust between patients and their providers, where vestigial misinformation can lead to

proceduralist care ill-equipped to meet trans patients' needs. Here, the historical perspective awards a unique lens to understand how a lineage of assumptions about trans people underlies current care options, pushing us to reconstruct our concept of gender affirming care to better meet the needs of trans patients.

Skeletons in the Closet: Sexing and Gendering Technologies in the Field and the Romanian Museum ***Kate Mower, University of Utah***

This paper explores two case studies of skeletal remains on display at the Museum of National History and Archaeology of Constanta (MINAC) in Romania. Both sets of remains were discovered during the Communist period, and they were gendered but never assigned a sex. This paper outlines the differences in gender and sex in Romanian language and in archaeological gendering and sexing theories and methods during the Communist period. It also explores the limitations of feminist archaeology in the west in the 1980s and 1990s in developing and implementing a feminist archaeological method. Communist sexing and gendering methods, then, offer feminist archaeologists a(n incomplete and flawed) method to utilize, critique, expand upon, or outright reject. Additionally, this paper examines 21st-century queer critiques of bioarchaeological methods by bioarchaeologists from Eastern Europe and queer critiques of bioarchaeological and funerary methods of sexing and gendering. Since many of these critiques originate in Eastern Europe, this paper explores a correlation between Communist bioarchaeological methods and these important 21st-century critiques of western European bioarchaeological methods.

126. Making Human Difference: New Perspectives on Racial Science

Organized Session

4:00 to 5:30 pm - Saturday 15 Nov.

Sheraton New Orleans: Floor 4th Floor - Nottoway

Histories of "race science" have long focused on practitioners of medicine, physical anthropology, and eugenics/genetics. Existing scholarship has examined how certain objects of scientific study—skulls, skin color, blood groups, DNA—became iconic of human difference. This panel turns instead to understudied contributors to racial science, like plastic surgeons and philologists, and unlikely tools of racialization, like the calorie and the fingerprint. The papers show how these tools and practitioners formed the core of transregional circulations of racial concepts and categories between Asia, Europe, and North America. Caleb Shelburne examines how 19th-century philological studies of the Ottoman language emphasized its composite character, inspiring debates about imperial identities and the Turkish race. Nina Mackert brings us to early 20th-century US nutritional science, which both relied on and reinforced anxieties about race and gender to establish its popular and scientific authority. Elise Burton investigates the science of dermatoglyphics, which studies heritable patterns in fingerprints and palm lines, and how Indian anthropologists' dominance in this field influenced genetic conceptions of racial and ethnic difference around the world. Finally, Adrien Gau traces the history of gender-affirming care in post-WWII Taiwan, connecting developments in cosmetic surgery and understandings of sex and gender with Taiwan's self-recognition as a modern nation-state. Our geographically dispersed case studies show how locally popular conceptions of race shaped the development of philology, surgery, calorimetric research, and dermatoglyphics. Meanwhile, the claims made by these scientific fields influenced national and international social and political discourses about human difference and identity. Our analyses therefore extend existing work on racial sciences of race with more global and interdisciplinary histories.

Participants:

The Limits of Language: Ottoman Philology and the Making of an Imperial Identity ***Caleb Shelburne, Harvard University***

When Şemseddin Sami Frashëri (1850-1904) published his Ottoman dictionary (1899-1900), he referred to his subject as "our language." But Sami had grown up speaking Albanian, and was in

fact a leading advocate for this “national” language. Whose language was Ottoman? And given that it was viewed as an amalgam of Turkish, Arabic, and Persian, how should it be defined? These questions pushed nineteenth-century Ottoman philologists both within and beyond the empire to enter ongoing debates about human identity and difference. Popular journals debated what to call the language. Lexicographers like Sami had to decide which words and grammatical structures were part of the language. And calls for language reform centered on purity and intelligibility long before the political emergence of Turkish ethnonationalism. But despite this significant output, the history of Ottoman philology as a social science remains understudied. This paper positions this field as central to the emerging conception of an “Ottoman” imperial identity. I trace this idea through the work of Sami and the Armenian philologist Bedros Zeki, both of whom embraced Ottoman philology from non-Turkish backgrounds. I show how their work involved transregional and transhistorical intellectual networks, widening the set of historical actors considered relevant to the history of language science. And finally, I suggest that conceptualizing the Ottoman language in turn also influenced general trends in comparative philology and race science.

Productive Uncertainty: The Making of Race and Sex in Early Twentieth Century U.S. Calorie Research ***Nina Mackert, University of Leipzig***

The talk highlights the intersections of metabolism science and racialized and gendered hierarchies by looking at dietary studies and laboratory experiments in the first two decades of the 20th century US. In the late nineteenth century, nutrition chemists introduced the food calorie to an American audience. While they initially focused on the calorie needs of differently active bodies and, hence, on labor, in the early twentieth century scientists turned to what they now called basal metabolism research. In seeking to determine the amount of food bodies needed just to function, they became interested in the influence of race and gender on metabolism. During a time when Americans were particularly concerned with distinguishing bodies along lines of race and gender, calorimetric research was a place of drawing these boundaries – but was also challenging them. At the same time, the experimental systems were precarious: complex and unpredictable systems producing sometimes incoherent data. As I will argue, while calorie research reinforced racial and gendered classifications, calorie standards themselves only became plausible, coherent, and significant to contemporaries by being tied to these normative bodily categories and their making of human difference.

Race Between the Lines: The Transnational Science of Dermatoglyphics ***Elise K Burton, University of Toronto***

Tracing a network of Indian and Iranian anthropologists from Delhi and Pune to Tehran and Toronto, this talk highlights how dermatoglyphics, a now-marginalized subfield of physical anthropology and genetics, brought South Asian concepts of human difference to the forefront of postwar racial science. Historians of race science have extensively investigated physical anthropology and human genetics, showing how skulls, skin color, and blood groups formed the basis for racial classification schemes. Much less attention has been paid to dermatoglyphics, the study of friction ridge skin patterns—that is, the patterns of skin lines found on human fingertips, palms, and soles. By the end of the nineteenth century, multiple scientists determined that particular features of fingerprint patterns were inherited. Accordingly, they sought to incorporate dermatoglyphics into the range of physical traits capable of diagnosing genetic differences between racial, ethnic, and other socially defined groups. The international uptake of dermatoglyphics for racial research roughly parallels that of blood-group genetics, beginning in the

1920s and accumulating massive datasets between the 1950s and 1980s. Compared to blood groups, dermatoglyphic data was easy to collect and analyze: handprints were collected with ink and paper, with no need for expensive refrigeration technologies and chemical reagents. These material aspects of dermatoglyphics paved the way for anthropologists from the Global South, particularly South Asia, to become the leaders of this field by the 1970s. Whereas scientific interest in dermatoglyphics declined in Europe and North America after the 1990s, it remains a vibrant field of research in Asia to this day. This talk explores the rise of Indian dermatoglyphic researchers and their long-term influence upon concepts of racial and ethnic difference abroad, particularly in Iranian genetics and in North American anthropology.

Skin, Face, Phalloplasty: Trans Medicine in Cold War Taiwan ***Adrien Gau, University of Pennsylvania***

In Taiwan today, sex reassignment and gender-affirming surgeries are categorized as cosmetic surgeries, which contributes to their exclusion from national healthcare insurance coverage. In turn, plastic surgery clinics offer top and bottom surgeries alongside double-eyelid surgeries, nose jobs, and other more common procedures. Cosmetic surgery itself remains peripheral to mainstream medicine and conventional notions of health. Unlike other branches of medicine, however, plastic surgery has always openly and necessarily been sensitive to subjective aesthetics, even—or especially—as they shift alongside deeply racialized or gendered power dynamics. This paper examines how plastic surgery in Cold War Taiwan shaped not only ideals of individual bodies, but also the image of Taiwan as a contested nation-state. Twentieth-century Taiwan was home to, on one hand, innovations in gender-affirming surgeries, born from physical and epistemic exchanges with Japanese and American biomedicine; and on the other, sensationalized news about individuals who were gender-nonconforming, sex-ambiguous, or simply interested in western fashion. Successful cases of cosmetic surgeries served to heighten Taiwan's own pursuit of western modernity: as a nation not only deserving of statehood, but more importantly, on par with the liberal West, by achieving scientific-medical modernity. Lastly, this paper also highlights the racialized logics interwoven through notions of human difference in both physiology and preferences in transnational contexts. They underlie surgical expertise, shape aesthetic-technical choices, and influence the trans-Pacific circulation of scientific-medical knowledge. Studying trans medicine in Cold War Taiwan thus allows us to interrogate the relationship between the purported objectivity of scientific medicine, the essential subjectivity of cosmetic surgery, and historically intertwined trajectories of medicine and statecraft.

Session Organizer:
Caleb Shelburne, Harvard University

Chair:
Suman Seth, Cornell University

127. Making and Shaping Humans, Animals, Plants, and Minerals in the Medieval and Early Modern World

Organized Session
4:00 to 5:30 pm - Saturday 15 Nov.
Sheraton New Orleans: Floor 4th Floor - Oak Alley

How are babies made? How does the generation of humans differ from that of animals, plants or minerals? And how can it be controlled? Such questions were debated by medieval and early modern authors working across disciplines, languages, and sites of knowledge production. Recent scholarship has demonstrated the significance of generation and reproduction to discussions of gender, race, heredity, creation, and evolution (among others) within the histories of science and medicine. This panel builds on such scholarship by bringing medieval and early modern discourses around human generation and alteration into conversation with those on the generation and alteration of animals, plants, and minerals. In this way, this panel reflects on the

ways in which medieval and early modern scholars approached the natural world and its manipulation, and how this in turn might have shaped their understanding of the human and the non-human, the natural and the artificial, the universal and the particular. By bringing theoretical texts into dialogue with illustrations and descriptions of techniques found across genres (from anatomical treatises and materia medica to recipe books and agricultural manuals), this panel seeks to understand how theory and practice might complement, overlap with or challenge each other, in addition to the role of artisanal and visual processes in informing theories and practices of generation and alteration. With a broad focus on materials from across northern Europe to South Asia, this panel aims to contextualize discussions of generation and alteration both in relation to and beyond ancient Greek antecedents. In this way, this panel explores how different locales of knowledge production developed and shaped theories and practices of generation and alteration in and across the medieval and early modern worlds. This session is sponsored by the Early Science Forum.

Participants:

Generation as Metaphor: Bodies, Environment, and the Individual in Late Medieval and Early Modern European Medicine ***Melissa Reynolds, Texas Christian University***

In medieval Europe, recipes related to menstruation, conception, lactation, and expulsion of fetal tissue were commonly included in learned medical recipe collections. These recipes entered the Latin corpus on the tide of Arabic medical scholarship that swept Europe in the twelfth and thirteenth centuries. Over time, as Latin recipe collections were translated into various European vernaculars, recipes related to generation were excerpted into catch-all miscellanies that also featured herbals, agricultural treatises, or horoscopes. The textual arrangement of these fifteenth-century collections certainly implied that human generation was subject to the same astrological or environmental influences that shaped the generation of medicinal plants, but as collections focused on practice rather than theory, such affinities were rarely made explicit. By the mid-sixteenth century, however, medical writers—from the German humanist Hieronymous Bock to the Swiss Paracelsian Bartholomaüs Carrichter to the English inventor and physician Timothy Bright—had begun to describe an explicit relationship between plants 'born' in a particular environment and the human bodies generated there, too. This paper traces a shift in how European medical writers conceptualized astrological or environmental influences on generation, both human and vegetal, across the divide that too often separates medieval from early modern medicine. Though this shift was the product of numerous factors—the humanist rediscovery of the Hippocratic treatise Airs, Waters, Places; post-Reformation confessionalization; European contact with the Americas; and Paracelsian theories of disease—I suggest that these treatises all sought to resolve a tension between the universal and the particular in medical practice and theory. Generation offered a metaphor that could accommodate both.

'The Origin of All Seeds': Knowing and Working with Variation in Ilkhanid Agriculture ***Riaz Howey, Max Planck Institute for the History of Science***

In the medieval Islamic world, the reproduction of plant characteristics was understood through multiple frameworks, including theories rooted in Hellenic naturalisms, revealed knowledge, and in various literary, legal, and social traditions. In regions such as post-Mongol West Asia, encounters with new cultural influences fostered creative accounts of life, generation, and the transmission of local traits and varieties. Technical and practical contexts offer a valuable perspective on conceptions of reproduced life, such as in agriculture and medicine, where knowledge was usefully applied and experimented with. This presentation examines how medieval farmers and scholars conceptualized plant variation and

sought to propagate desirable traits such as hardiness, taste, disease resistance, and drought tolerance. A central focus is the agricultural work of Rashīd al-Dīn Fażlullāh Hamadānī (1247—1318 CE), an elite figure of the Ilkhanate (Mongol West Asia). Rashīd al-Dīn frequently drew analogies between plant specialisation and the diversity of peoples and ideas within the Mongol Empire, which scholars link to a period of intense early globalization in Eurasia. Beyond theoretical discussions, this study explores representations of techniques used to recognise, induce, and preserve variation in plant generations.

Contraceptive Recipes in Materia Medica from the Medieval Islamic World ***Beatrice Bottomley, The University of Bologna***

Contraception and contraceptive recipes are an important theme in medical texts from the medieval Islamic world. They form part of wider discussions of birth control, which was considered key to the physician's art, often meriting whole chapters in medical works. Recipes for contraceptives make use of animal parts, plants, and minerals, such wolf's blood, walnut leaves or malachite. Their administration ranges from ingestible to intravaginal and they are often centred on female use. Scholarship of contraception in the premodern Islamic world has often focused on arguments around its permissibility, with a particular emphasis on legal and theological theory. Although scholars have noted the vast number of recipes for contraceptives (and abortifacients) in texts of medical practice, their discussions have tended to be limited to whether these techniques were 'irrational' or 'rational', 'popular' or 'learned', and have placed emphasis on the development of 'rational' recipes that could be effective through chemical or mechanical means. This paper examines a selection of recipes for contraceptives using animal parts, plants, and minerals that are described in materia medica from the medieval Islamic world. By bringing these recipes into conversation with theories and practices of generation discussed in philosophical and medical texts, in addition to works on zoology, botany, and mineralogy, this paper reflects on how these recipes drew upon connected understandings of generation across the animal, vegetal, and mineral realms. This paper traces parallel recipes found in sexual manuals and handbooks of wondrous techniques in order to consider how understandings of contraception and contraceptive techniques developed beyond the medical domain.

The Lone Pregnant Body: Illustrating Feminine Forms in Manṣūr's Anatomy ***Sonia Wigh, University of Cambridge***

The Tašrīḥ-i Manṣūrī (Manṣūr's Anatomy) is the first known medical text in the Persianate world containing full-body anatomical images. It was composed in 1386 CE by Manṣūr bin Muḥammad bin Ilyās Shīrāzī of Shiraz (Iran). A standard copy of Manṣūr's Anatomy contained six illustrations of a skeleton, nerves, muscles, veins and arteries, digestive tract and other vital organs, and a female form with gravid uterus. This paper tracks the visual evolution of the female form in various manuscript copies of the Tašrīḥ, culminating in its lithographic print in Delhi in the 1840's. By highlighting key moments of transformations, I demonstrate that while there were limited changes in the five illustrations of human (male) anatomy, there was a stark difference in the way the female form was perceived in the manuscript version, from schematic drawings to full-figured female bodies with geographical, nationalistic markings in eighteenth-century India and Qajari Iran. Initially, the six full-length anatomical drawings in the Tašrīḥ-i Manṣūrī consist of schematic outline of the human body in a squatting position, with their hand on their knees. Some even argue that the sixth image (purportedly added by Ibn Ilyās himself) was actually a gravid uterus superimposed on the pre-existing illustration of the arterial networks. Over the course of two centuries, from feminine markers like hair, the sixth image assumed a more naturalistic, aesthetic human

female bodily form. Although one cannot assume a transposition of identical knowledge-making practices across time and space, this paper attempts to follow the evolution in visual language of one image and map onto changing consumption patterns caused by socio-cultural and economic transformations over a course of two centuries in India and Iran.

Session Organizer:
Beatrice Bottomley, The University of Bologna

Chair:
Lauren Kassell, EUI/Cambridge

128. HSS Prize Ceremony & Sarton Q&A

Plenary Session
6:00 to 7:30 pm - Saturday 15 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon C

HSS Prize Ceremony

SUNDAY, NOVEMBER, 16

129. HSS Member Business Meeting
Business Meeting
7:30 to 8:45 am - Sunday 16 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon C

130. Registration Day 4
8:00 to 11:30 am - Sunday 16 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon Registration Desk

131. Engaging with Improbable Experiments
Organized Session
9:00 to 10:30 am - Sunday 16 Nov.
Sheraton New Orleans: Floor 4th Floor - Bayside ABC

What should historians of science do when confronted with seemingly implausible experimental results reported by historical actors, especially those results that are contrary to what our modern scientific knowledge dictates? We could simply report them without passing judgment, but that would be akin to the news media simply reporting wild claims made by politicians without offering any critical assessment. Going beyond such passivity, we can enhance our understanding of the history by materially engaging with the reported phenomena ourselves, starting with attempts to reproduce them. In the spirit of what Hasok Chang has designated as “complementary science,” such experimental work can produce scientific as well as historical knowledge. If we succeed in reproducing past results that our current science ignores or deems impossible, then we have added something to modern scientific knowledge. Difficulty in reproducing past results, on the other hand, calls for a different historiographical framing of the practices that allegedly led to those results. Such historical–scientific work is closely related to the work of the past scientific practitioners themselves, as articulated by Jennifer Rampling’s notion of “practical exegesis” in the work of alchemists trying to decipher texts by other alchemists. This session will showcase four instances of such engagement with improbable experiments, taken from the chemical sciences over the centuries, from medieval to modern. Our presentations will also include some methodological reflections on the possibility and uses of such engagement with improbable experimental results.

Participants:

The Expected, the Unexpected, and the Unimaginable: Making Sense of the Variety of Results Described in Alchemical Texts *Lawrence Principe, Johns Hopkins University*

For much of the time since the eighteenth-century eclipse of transmutational alchemy, the results described in chrysopoetic texts were widely thought to be imaginary or fabricated. Over the past generation, however, successful experimental reproductions of alchemical processes have clearly demonstrated that many such results, even some remarkably surprising ones, can in fact be obtained as described, once a variety of factors such as material purity and correct textual interpretation are taken into account. But what about metallic transmutation, a process undergirded by premodern theory but ruled out by modern chemical theory? Does the evident impossibility of metallic transmutation undercut the claims of the “new historiography” of alchemy regarding the clear-headed practical endeavors and experimental prowess of alchemical authors? This talk will examine some features necessary for making seemingly improbable or impossible alchemical processes “work,” and then endeavor to explain how and why chyrsopoetic authors juxtaposed highly-workable (if sometimes obscure) processes with claims of successful metallic transmutation.

Signs and Tokens: Reenacting Alchemical Recipes in Early Modern England *Jennifer Rampling, Princeton University*

In early modern England, alchemical practitioners collected and studied medieval manuscripts, seeking material for new trials and experiments. By recovering and reconstructing the techniques of ancient alchemists, they sought to confer additional prestige on their own

experimental endeavors, often feeding their observations back into their own textual accounts of practice—a feedback loop that I have termed “practical exegesis.” But what happened when the practice failed? When alchemists encountered strange or anomalous observations in their own work, they had to judge whether the authority wrong, or their own reconstruction. In this paper, I trace how English alchemists like John Dee, William Butler, and Samuel Norton tackled such anomalies by blending reading practices with observational skill: hunting for evidence of the visible “signs and tokens” described in their authorities. This work is informed by my attempts to reconstruct their experiments in a modern laboratory—in the process, developing and applying my own set of interpretive tools.

“So Perfect an Amalgam”: Making Sense of the Metallization of Ammonia ***Sarah Hijmans, Université Paris Cité - Laboratoire SPHERE***

During one of his lectures at the Royal Institution, Humphry Davy wondered at the finding that ammonia formed with mercury “so perfect an amalgam”. Only metallic substances were known produce this type of alloy with mercury, and ammonia, a compound of nitrogen and hydrogen, did not contain any metals according to the chemical knowledge of the time. Davy was one of many chemists fascinated by the apparently contradictory existence of the amalgam from its discovery in 1808. This experiment motivated them to either question the elementary nature of hydrogen and nitrogen, or suggest that these elements could combine into a compound metal called ‘ammonium’. Throughout the nineteenth and twentieth centuries, various interpretations of the amalgam and the possible metallic nature of ammonium were proposed, and the apparent metallization of ammonia largely remains to be clarified today. In this talk, I will ask how we as historians of science might make sense of this improbable and largely forgotten experiment. Although surprising even according to today’s scientific knowledge, the experiment can be quite easily reproduced using the historical descriptions. I argue that the difficulty of explaining this phenomenon is precisely what makes it historically interesting, because it provides an insight into the ways that chemical practitioners dealt with this kind of uncertainty. Focusing on the examples of Davy and other nineteenth-century chemists, I will analyze the strategies they adopted in the hopes of developing coherent explanations in order to make sense of the metallization of ammonia.

The Forgotten History of Contact Electrochemistry ***Hasok Chang***

Standard histories of 19th-century electrochemistry have framed it as a long-running conflict between the “contact theory” and the “chemical theory” of batteries. While this framing contains much truth, it also obscures many important things. One area of neglect is what I call “contact electrochemistry”, which investigates how chemical reactions are affected by the physical contact between different materials (especially metals). A well-publicised instance of contact electrochemistry was Humphry Davy’s proposal in the 1820s to protect the copper bottom of ships from corrosion in sea water by attaching pieces of zinc to the copper; the zinc was corroded, and in the process protected the copper. This proposal was trialled by the British navy but rejected for practical reasons, and the theoretical basis of the proposal was not clear, either. However, Davy’s proposal was backed up by laboratory experiments. I have easily reproduced Davy’s experiments on the corrosion of zinc and copper, separately and in mutual contact, in salt water. I have also devised and performed various other interesting experiments in contact electrochemistry. Chemists today are familiar with “sacrificial zinc” and, more generally, “cathodic protection” is a standard practice in corrosion science and engineering. But this phenomenon is not incorporated into the standard explanations of battery action. In my view,

contact electrochemistry is a crucial aspect of the operation of many common batteries, although this has not been recognized. This becomes clear especially when we consider batteries in which chemical action only takes place if the circuit is closed by connecting the two electrodes, which are made of different metals. Closer attention to contact electrochemistry promises to yield many results of historical and scientific relevance.

Session Organizer:
Hasok Chang
Chair:
Hasok Chang

132. Shaping Matter, Shaping Text: Practical Knowledge-Making in the Pages of Early Modern Books
Organized Session
9:00 to 10:30 am - Sunday 16 Nov.
Sheraton New Orleans: Floor 3rd Floor - Borgne
This panel explores the materiality of practical knowledge in the early modern period through curated and customized textual artefacts. Moving beyond a narrow history of science, it engages with a broader history of knowledge — one that foregrounds the entanglement of practice, materiality, and textual production. Rather than viewing knowledge as the by-product of hands-on experience alone, the panel examines how it was shaped and stabilized on the page. Focusing on genres such as recipe books, herbals, and alchemical albums, it considers how professional writers, artisans, and practitioners assembled knowledge through acts of compilation, selection, and adaptation. These processes are drawn not only on lived experience and empirical observation, but also on established textual traditions and visual codes. The panel brings renewed attention to the textual technologies through which practical knowledge was structured, mediated, and transmitted. While reconstruction, replication, and re-enactment (RRR) have illuminated tacit dimensions of early scientific practice —especially in alchemy — this panel shifts focus to the written artefact as a site where practical knowledge was actively formed and reformulated. By examining the textual strategies through which early modern writers and artisans, craftspeople, and alchemists transformed experiential knowledge into durable and authoritative formats, the panel highlights the reciprocal relationship between material practices and textual media. These products were not passive records, but dynamic instruments that adapted knowledge for transmission across time, place, and audience. In so doing, the panel reveals how early modern compilations shaped the contours of practical knowledge — making it legible, teachable, and materially grounded.
Participants:

Visualizing the How-To: Alchemical Albums and the Organization of Knowledge in Early Modern Europe *Sergei Zotov, Warburg Institute*
This paper explores the role of alchemical albums in shaping and transmitting practical knowledge between 1600 and 1800. Distinct from traditional manuscripts, alchemical albums compile series of allegorical and technical images — often without accompanying texts — into coherent visual narratives. Drawing on a corpus of rarely studied albums across Europe, this paper examines how these compilations, engage with the material culture of recipe books, books of secrets, and medical compendia. While some albums serve as repositories of established imagery, others creatively reinterpret visual traditions, presenting alchemical processes through allegoric means. By analyzing image sequences, layout strategies, and occasional marginal recipes or inscriptions, I argue that alchemical albums exemplify a visual mode of knowledge organization. Their structure often mirrors that of textual handbooks: staged procedures, emblematic steps, and repeated motifs stand in for verbal instruction. These albums not only illustrate but encode practical operations, including distillation, purification, and transmutation, within allegorical frameworks. Furthermore, their production was embedded in broader networks of compilation and manuscript culture, where collectors, practitioners, and professional writers collaborated to

preserve, reinterpret, or commodify alchemical expertise. Ultimately, this paper situates alchemical albums within the history of practical knowledge and book production, demonstrating how they both reflect and shape early modern strategies of learning, collecting, and transforming nature.

Data-Driven Approaches to Books of Secrets ***Sarah Lang, Graz University***

The historical practices of artisans, craftspeople, and alchemists are increasingly recognised not merely as precursors, but as foundational to the development of modern natural sciences and chemistry. The Experimental History of Science with its so-called 'RRR methods' (reconstruction, replication, and re-enactment) has become pivotal for exploring the tacit and practical dimensions of early scientific practice, particularly in the historiography of alchemy, and foregrounded recipes as important historical sources of everyday knowledge. A particularly rich corpus is found in the 'books of secrets'—a genre of how-to literature that witnessed a peak in popularity during the print boom in the second half of the 17th century, where chymical knowledge became a form of 'currency' in the marketplace of entrepreneurial alchemy and the 'economy of secrets'. These volumes, often several hundred pages long, compile recipes in structured, domain-specific layouts, using multi-column formats, indexing systems, alchemical symbols, and specialised measurement characters. While RRR methods can fill 'documentary gaps' in historical sources that only practical knowledge can complete, computational methods provide a large-scale overview when conventional close reading proves too limited, or the amount of data is impractical to process manually. While large-scale digitisation has made many recipe texts from books of secrets digitally accessible, their complexity poses significant challenges for running data-driven analyses, despite the opportunities such methods offer. For example, they enable tracking of similar recipes across different books, offering insights into compilers' knowledge curation practices and helping to answer questions such as: How do the everyday how-to recipes contained within 'books of secrets' relate to the 'rhetoric of secrecy' which is their sales proposal? What types of processes are the most frequent and by how much do they differ? From a large-scale macro perspective, what is the quantitative makeup of this popular genre that remains understudied at scale? This paper explores the methodological steps required to make this genre computationally tractable, from encoding structured content to tracing recipe variation, ultimately offering new insights into early modern knowledge economies and editorial practices.

Plants & Paper: Material Evidence of Knowledge-Making in the Pages of William Salmon's Botanologia ***Megan Piorko, Villanova University***

William Salmon, M.D. published the English herbal, Botanologia, as two large, hand-press volumes in 1710. Also considered a "history of plants", this encyclopedic reference text provides the following information for over 700 plant specimen (organized in alphabetical order): Greek, Latin, and English names; classifications; descriptions; places of growth; times of flowering and seeding; qualities; specifications; preparations; virtues; dosage and uses. The comprehensive Botanologia also boasts "a complete florilegium" instructing the reader on how to cultivate the various plants for their apotropaic properties—complete with original woodcuts illustrating the hundreds of plant specimens elucidated in the text. Pressed between the pages of the copy held by Villanova University are organic examples of many of the plants described in the text of Botanologia. The juxtaposition of biological plant specimen adjacent to the knowledge presented on the page shows historical actors directly engaging with nature as an important aspect of knowledge-production in medicinal

manuals and botanical reference texts. This material evidence illustrates early modern scientific processes of verifying knowledge through practical application and observation in tandem with the theoretical, natural knowledge on the page. Salmon published his Botanologia near the end of his life—as a synthesis of Paracelsian approaches to medicine and alchemy with the natural knowledge complied throughout his career and world-travels. Tracing the provenance and ownership provides context to the natural knowledge produced within the pages of this unique copy of Botanologia and the ways in which medical practitioners and healers directly engaged with herbals.

Session Organizer:

Megan Piorko, Villanova University

Chairs:

Sergei Zotov, Warburg Institute

James Voelkel, Science History Institute

133. Specializing in the Wholly Impossible: Black Health Activism in the 20th Century US

Organized Session

9:00 to 10:30 am - Sunday 16 Nov.

Sheraton New Orleans: Napoleon A1

This panel examines how Black Americans have navigated systemic neglect and opposition in their struggles for health and justice throughout the twentieth century. Each of our presenters explores key episodes in health activism which highlight how activists and medical professionals challenged governmental policies and racial science that served to perpetuate racial, socioeconomic, and health disparities. Dr. Alyssa P. Cole traces the historical trajectory of African Americans' access to medicine and community organizations' role in alleviating health inequities in North Florida. Cole argues that due to segregationist policies and their reverberating impact, Black Americans faced inconsistent access to modern medical care, leading them to rely on alternative healthcare methods, such as traditional African medicine, interstate travel, and reliance upon community health initiatives, such as traveling physicians and clinics. Dr. Nic John Ramos examines how proponents of Emergency Medical Systems (EMS) responded to the anti-tax voter movement of the late 1970s and 1980s by diverting funding for public hospital and clinic services associated with poor people of color to support new publicly-funded emergency medical services associated with white suburban and rural voters. Ramos argues that in spite of the imbalance between its use and its costs and its extremely limited capacity to improve society's overall health outcomes, EMS proponents successfully lobbied legislators and voters to see emergency medicine as a more democratic and universal solution to distributing healthcare than publicly-funded hospital and clinic services. Dr. George Aumoithe examines how the first Community Accountability Boards (CABs) were established via direct community elections in New York City in the early 1970s. His presentation focuses in particular on the Harlem Hospital Center Board's election, in which 1,400 people voted for a slate of "healthcare consumers," youth, senior citizen, medical and/or dental staff, licensed nurses, non-physician and non-nursing, and individual representatives to constitute the 45-person CAB. Lastly, Dr. Adam Biggs's presentation explores how Black medical doctors in the early-twentieth century used their medical research to challenge derogatory racial science. Critiquing scientific studies that disparaged or denigrated Black patients, his work shows how Black doctors used their scientific acumen to debunk popular scientific beliefs that maintained Black patients were predisposed to certain illnesses and unresponsive to modern therapeutic measures. By challenging these assumptions, Black doctors sought to expand access to public health resources and medical treatments for Black communities. Together, this panel offers a nuanced understanding of how health activism has contributed to social change and advanced the ongoing struggle for a more inclusive and equitable healthcare system despite obstructions from the state and medical profession.

Participants:

"From Nothing Has the American Negro Suffered More than from Misrepresentation:" Black Doctors and Their Challenge to Early-20th Century Racial Science *Adam Biggs, Rensselaer Polytechnic Institute*

This paper examines how early-twentieth century Black doctors used their medical

research to debunk theories of African American biological inferiority and racial degeneration. Drawing on scientific publications by Black physicians—including works from the Journal of the National Medical Association—my presentation analyzes how historical figures like Charles Roman, Louis T. Wright, and others used their research to affirm African Americans' physiological equivalency, shared propensity for disease, and comparable receptivity to modern therapeutic practices. In contesting racialized medicine, however, Black doctors often relied on normative understandings of health and healing that tacitly embraced eugenic hierarchies. Ironically, while they sought to affirm the capacity of African Americans to participate as equal citizens in American society, their efforts also subtly reified forms of social stratification that privileged bourgeois notions of respectability and, even as they sought to eradicate white supremacy from medical practice, normalized it as a standard for measuring health and well-being.

Healing Beyond Boundaries: An Examination of African American Health in 20th Century Florida ***Alyssa P. Cole, University of Florida***

This presentation traces the historical evolution of African Americans' access to medical care in Alachua County, Florida, highlighting the significant role that community organizations have played in addressing health disparities. It examines how segregationist policies, both explicit and implicit, have created enduring barriers to consistent and equitable healthcare for Black Americans. Despite being geographically close to a billion-dollar healthcare infrastructure, African Americans in Alachua County have often found themselves marginalized and underserved by the mainstream medical system. These systemic inequities, my research reveals, have forced Black communities to seek alternative healthcare solutions. These alternatives include the use of traditional African medicinal practices, which have been passed down through generations and adapted to the local context. Additionally, the necessity of interstate travel to access better medical facilities underscores the lengths to which African Americans have had to go to receive adequate care. Community health initiatives have also been pivotal, with traveling physicians and clinics providing essential services that the formal healthcare system failed to deliver. Through analysis of historical records, oral histories, and community archives, my work illustrates the resilience and resourcefulness of African American communities in the face of systemic neglect. It not only sheds light on past struggles but also emphasizes the ongoing need for equitable healthcare reforms to address the persistent disparities that continue to affect Black Americans today.

How to Elect a Community Accountability Board ***George Aumoithe, Harvard University***

This paper will examine how the first Community Accountability Boards (CABs) were established via direct community elections in New York City in the early 1970s. It will focus in particular on the Harlem Hospital Center Board's election, in which 1,400 people voted for a slate of "healthcare consumers," youth, senior citizen, medical and/or dental staff, licensed nurses, non-physician and non-nursing, and individual representatives to constitute the 45-person CAB. How did the Health and Hospitals Corporation organize these elections? What was the voting experience like for local residents? By examining the mechanics of running a CAB election in the nation's densest public hospital system, this analysis of newspapers and archival memoranda will unfurl the burgeoning promise of 60s-era maximum feasible participation principles on the ground in the 70s.

Political Whiteness and Emergency Medicine: Military Medicine as the Electorate's Imperfect Solution to 1980s Public Health ***Nic John Ramos, Drexel***

University

This paper examines how proponents of Emergency Medical Systems (EMS) responded to the anti-tax voter movement of the late 1970s and 1980s by diverting funding of public hospital and clinic services associated with poor people of color to support new publicly-funded emergency medical services associated with white suburban and rural voters. Using the papers of James Page, a leader in EMS services, it traces the Reagan federal budget crises of the 1980s to the birth of EMS and the anti-tax movement to Los Angeles after the Watts Uprisings of 1965. In spite of the imbalance between its use and its costs; and its extremely limited capacity to improve society's overall health outcomes; EMS proponents successfully lobbied legislators and voters to see emergency medicine as a more democratic and universal solution to distributing healthcare than publicly-funded hospital and clinic services. Both legislators and voters, in turn, used well-known discourses of race and street violence to normalize gun violence and emergency medicine by supporting greater policing, prisons, and securitized state prisons to contain and protect white voters from death. The result provided white citizens with publicly-funded emergency rooms that complemented the hospital and clinic services they paid for through the free market while leaving those citizens who were most vulnerable to poverty and violence with health services that were the least able to bring them to true health.

Session Organizer:

Adam Biggs, Rensselaer Polytechnic Institute

Chair:

Adam Biggs, Rensselaer Polytechnic Institute

134. Gendering Mind and Body in the Recent History of Psychological Culture

Organized Session

9:00 to 10:30 am - Sunday 16 Nov.

Sheraton New Orleans: Floor 3rd Floor - Napoleon A2

The feminist movement of the 1960s and 1970s was the substrate for the development and institutionalization of feminist psychology in the United States. In fact, several historians have argued that these two developments drew intensely on each other – psychology on feminism, and feminism on psychology. But as the 1970s gave way to the bread-winner conservatism of the 1980s and 1990s, with its return to pro-natalist, pro-family agenda, how did the newly formalized field of feminist psychology – and the popular discourses with which it was entangled – respond to and inform attempts to regulate women's bodies and minds? While much has been written about the feminist critiques of the psy-sciences in the 1970s, the impact of the increasing conservatism of the ensuing decades on feminist psychology have been less well-explored. Here we delve into the psychologization of self-help, the menstrual experience, and the pro-life versus pro-choice debates in what some have termed a "post-feminist" period, to illuminate the increasingly tenuous hold of feminist psychology on structural critique. In her paper, Jill Morawski finds in the burgeoning self-help literature a complicated feminism that champions a masterful, sovereign selfhood while chronicling the systemic sexism that shapes women's experiences. Stephanie Pache questions the epistemological configurations proposed by feminist psychologists to understand menstrual issues and the gender embodiment that they seem to represent. Alexandra Rutherford examines the response of feminist psychologists to the invention of post-abortion syndrome by conservatives and Christian evangelicals, who sought to overturn Roe v. Wade with the argument that abortion traumatized women.

Participants:

Boundaries for the Self: Gender Politics in Postfeminist Self-Help Psychology *Jill Morawski*

Second-wave feminism targeted the structural foundations of women's oppression, attending as well to sexism's psychological causes and consequence. By 1990 feminist consciousness of gender psychology permeated North American self-help discourse, echoed in Gloria Steinem's 1993 call for women's "recovery" and "self-esteem". While the discourse's

focal shift toward championing personal change has been documented, less is known about the substance of this popular, on-the-ground feminist psychology and its gender analyses. The proliferating self-help books on recovery and psychological boundary maintenance appearing in the 1980s give sparse attention to political or economic conditions that affect women's lives. Instead, they narrate a discordant gendered psychology that couples claim of women's vulnerabilities to victimization with wholesale assurance of women's powers to transform their lives and relationships. They aim to raise consciousness of a sovereign self that can triumph over personal harms and traumas. To realize that self, readers are guided in building a boundaried social world in which they become masters. The detailed instructions prioritize autonomy while overlooking political-economic circumstances as well as the complicating fact that the walls are engineered with negative experiences. The 'cruel optimism' of this boundary psychology plays on the conventional feminine domain of relationships, ultimately promoting walled defenses against interpersonal dangers while ignoring political and economic ones.

Period Piece: Psychology to the Rescue of Gender Embodiment ***Stéphanie Pache, Université du Québec à Montréal***

Menstruation seems to constitute the female body, to literally make it female. It is therefore a site of a specific cultural and professional intervention on women. Embodying the female condition, it is not surprising that menstruation became the object of feminist attention, and its attached representations a target of the feminist critique. What might be more surprising is how menstruation and menstrual issues became the object of many psychological studies conducted by feminist psychologists since the 1970s. This paper analyzes the contributions of these US feminist psychologists (such as M.B. Parlee, P. J. Caplan; J. Chrisler; J. Ussher; I. Johnston-Robledo; G. Einstein; E. Przybylo; B. Fahs); from their critique of sexist assumptions and bad science to alternative conceptions of gender embodiment as studied in the menstrual experience. I will examine their approaches of the menstrual experience and discuss the contribution of feminist psychological perspectives to the understanding of gender embodiment. Why did psychologists become so involved in researching what appear to be a banal biological phenomenon? I will argue that the psychologization of the menstrual experience represents a common contemporary strategy to push back against naturalistic arguments while preserving an accepted scientific epistemology. Feminist psychologists played and are playing an important role as experts of the gendered experience. What light does this history shed on our current representations of embodiment, gender, and their relation?

Between Science and Politics: Psychologists Take on Post-Abortion Syndrome ***Alexandra Rutherford, York University***

From the involuntary institutionalization of unruly or unwanted wives by reason of their purported "insanity" in the 19th century, to the specious invention of "Post Abortion Syndrome" (PAS) to restrict women's reproductive rights at the end of the 20th, the history of women's mental health is as much about politics as it is about science. In this paper, I explore this claim through a close analysis of the invention of PAS by anti-abortion mental health professionals in the period between Roe v. Wade (1973) and Dobbs v. Jackson (2022). During this time, PAS was deployed relentlessly by right-wing politicians, pro-lifers, and evangelical Christians as part of a multipronged strategy to reverse women's constitutional right to access abortion. Arguing that pro-choice feminists, including feminist psychologists, had downplayed the seriousness of the emotional trauma caused by abortion, lobbying groups such as "Operation Outcry" used "aborted

women's" own testimonials to heighten support for their campaign. Drawing on reports from two American Psychological Association Task Forces and reflections on them by members, I explore the strategies used by psychologists to reinforce their scientific objectivity and authority while advocating for an essentially pro-choice position: that any negative mental health effects of abortion, even when they exist, should not be used to undermine a woman's right to choose. Their efforts reveal the complex, and perhaps untenable, choreography required to separate the science from the politics of women's mental health.

Session Organizers:

Stéphanie Pache, Université du Québec à Montréal

Jill Morawski

Chair:

Stéphanie Pache, Université du Québec à Montréal

135. Margins of Belief: Science, Religion, and Alternative Worldviews in Late 19th and Early 20th Century America

Organized Session

9:00 to 10:30 am - Sunday 16 Nov.

Sheraton New Orleans: Floor 3rd Floor - Napoleon A3

This panel includes three papers that connect marginal religions and cosmologies with new scientific discoveries in the United States at the turn of the twentieth century, with a discussant (Lyn Millner) who is an expert on these religious movements. The marginal cosmologies covered include Koreshianism (invented by the cult leader Cyrus Teed), black magic (including Hoodoo, Conjure, and Voodoo) and flat-earthers. These papers examine continuities between these worldviews and the way mainstream Christianity intersected with science during this period, and also connect these views with changing views on race at this time.

Participants:

Finding God in the Laboratory: Divine Alchemy from Chapel to Cult, 1840-1920 ***Timothy L Alborn, Lehman College, CUNY***

In both the US and Britain in the middle of the nineteenth century, alchemy led two vastly different discursive lives. On one side, preachers and scientists scorned it in books and lectures as a "popular delusion," a superstition much in need of being swept away in the great tide of modernity. At the same time, alchemy flourished as a metaphor, describing divine agency in faith as well as nature. Preachers, in this context, sought to keep up with the secular trend toward rationalism without wholly abandoning their commitment to God's mysterious ways, which personifying Him as an alchemist accomplished. But after 1880, just when the march of scientific progress had seemed to banish alchemy to history's dustbin, it made a surprising reappearance, finding advocates who connected advances in atomic theory with much older alchemical speculations. Historians have mostly noticed this in elite circles within Britain and France, evident in the Alchemical Society, the theosophy movement, and the revival of Jacob Boehme's "spiritual alchemy." Although theosophy mixed Eastern religion into its embrace of alchemy, few of these groups tried to combine their new enthusiasm for alchemy with older appeals to Christianity. Finding God in this new setting requires a deeper dive into the lively landscape of American occultism, much of which retained a distinctly Christian component. In this paper I discuss one strand of that story, in the self-described "cult" led by Cyrus Teed, otherwise known as Koresh. In his long-running magazine The Flaming Sword, Teed engrafted an all-encompassing belief in cosmic alchemy onto a literal reading of the Bible, while keeping his followers up to date on each new discovery (and many bogus claims) in the rapidly evolving science of chemistry.

"A Forward Creeping of the Eternal Dawn": Race Science and Metaphysics in Jim Crow America ***David G. Cox, University of Southampton, UK***

In his 1905 white-supremacist tract, The Color Line, William Benjamin Smith argued that the "whole discussion" around Black suffrage and citizenship was "biological in its bearing." In common with most of the

American scientific profession at the zenith of Social Darwinism, the Tulane professor of mathematics viewed racial hierarchy as biologically determined. And yet, whilst appealing to the authority of empirical science, Smith wrote in distinctly mystical terms about white, southern "blood," whilst supporting his predictions of ultimate Black extinction with references to the Kabbalah. I will argue that Smith's blending of the material and metaphysical was not as paradoxical as it might first appear. At the turn of the century, white supremacists like Smith set out to juxtapose white, scientific modernity against Black, superstitious premodernity. The turn-of-the-century explosion of discourse on African American magic (Conjure, Hoodoo, and Vodou) was part of this effort to construct a racialized modernity. However, the boundary between these constructed categories remained unstable because the concept of race is itself fundamentally magical: race is metaphysical in that it depends upon the action of an invisible world upon the visible. I will proceed to argue that this unstable compound of science and superstition can be traced back to the foundation of Enlightenment taxonomy (Linnaeus included homo ferus and homo monstrous alongside homo sapiens), and that scholars seeking to refute Weber's thesis of disenchantment might pay more attention to the enchanted nature of race. The paper will conclude that the racial science of Smith and others during the late nineteenth and early twentieth centuries is further proof of Bruno Latour's contention that "we have never been modern."

Fear of a Flat Planet: Black Alternative Religions and Alternative Worldviews, 1878-1950 ***Eddie Guimont, Bristol Community College***

Prior to the US Civil War, the Book of Exodus, with its story of Israelites being freed from bondage and led to a Promised Land of freedom, held a particularly central position for the religion of enslaved Blacks. But with the failure of Reconstruction in 1877, the Exodus narrative lost much of its meaning, leading to new religious articulations that could deal with the new circumstances of paradoxical freedom but loss of support from white authorities. The years after Reconstruction led to the development of new political and religious movements among the Black communities of the South, spreading elsewhere with the Great Migration. I will focus on two specific religious movements: the Sixth Mount Zion Baptist Church of Richmond, under Reverend John Jasper; and the Church of the Living God, the Pillar Ground of Truth for All Nations, of Chattanooga and Philadelphia, under Prophet Frank S. Cherry. While the former was standard Southern Baptist, and the latter a foundational Black Israelite sect, they were united by the belief that the Earth was flat. I argue that the flatness of the Earth became central to both movements, different as they were, due not only to interpretations of newly-relevant Old Testament verses highlighting Israelites' more active struggle, but also as a response against the influence of Antebellum scientific orthodoxies in Charleston and Richmond. I will also argue that the particular political utility of Flat Earth to Jasper and Cherry, along with figures such as Reverend James S. Hatcher and Father Divine, was not static but reacted to other developments such as the Exoduster Migration; Wilbur Glenn Voliva's Zion, Illinois cult; the Scopes Monkey Trial; and the popularization of Immanuel Velikovsky's own alternate religious cosmology among white audiences, which finally offered a way to integrate the Black alternative cosmologies just ahead of the start of the traditional Civil Rights Movement.

Session Organizer:

Timothy L Alborn, Lehman College, CUNY

Chair:

Lyn Millner, Florida Gulf Coast University

136. Ocean Infrastructures and Future Oceans

Organized Session

9:00 to 10:30 am - Sunday 16 Nov.

Sheraton New Orleans: Napoleon B1

Coastal and marine environments are, and have been, spaces shaped by science and policy, but also by infrastructure. The three papers in this session examine instances of underwater infrastructure intended to maximize or enhance the extraction of fish and/or oil. In the second half of the twentieth century, in two geographical contexts, the Gulf of Mexico and Japan, we see the aspirational, future-oriented character of the efforts to understand and intervene in these natural systems. Samm Newton, focusing on the first Gulf of Mexico offshore rig out of sight of land, investigates how science, policy and infrastructures transformed the geological curiosity of salt domes to sources of oil in the 1940s. Also in the Gulf of Mexico, Samantha Muka examines how infrastructures, considered together with natural structures, shaped and constrained efforts to maximize extraction of both fish and oil in the 1970s and 80s. Lijing Jiang focuses on efforts in Japan to enhance fish resources through infrastructures in the 1960s and1970s, to compensate for things that proved uncontrollable, such as pollution.

Participants:

The Ocean Pours Out of the River's Mouth: Salt Domes, Submerged Plains, and Stepping Out of Sight ***Samm Newton, University of Wisconsin–Madison***

Salt domes—once geological curiosities—became pivotal scientific and economic objects in the early twentieth century, transforming the Gulf of Mexico into a contested "petroleum province." Drawing on Lorraine Daston's framework of scientific object formation, I argue that salt domes gained salience through the hybrid practices of geologists and policymakers. The 1901 Spindletop discovery institutionalized salt domes as proxies for oil, while military seismic technologies enabled their detection underwater. By the 1940s, salt domes anchored speculative ventures into the continental shelf, exemplified by Kerr-McGee's pioneering drilling at Ship Shoal—the first offshore rig out of sight of land. Tracing the interplay of the geosciences in industry and policy, I show how the Gulf became a site where terrestrial knowledge was extrapolated seaward. Offshore oil exploration relied on constructing the seafloor as both a wilderness and a rationalized frontier. These marine environments were the first steps into deeper and more distant ocean waters. They mediated debates about resource visibility, jurisdiction, and the very nature of subterranean space—revealing the ocean floor as a critical site for twentieth-century environmental and scientific history.

Crafting the Submarine Petroleumscape: The Texas Coastal and Marine Council, 1972-1985 ***Samantha Muka, Stevens Institute of Technology***

Histories of coastal environments show how human infrastructure shapes present and future use of these spaces. A petroleumscape is identified as a coastline built around the extraction and movement of oil and gas. The ports of San Francisco, Corpus Cristi, New Orleans, and Philadelphia have been studied as petroleumscapes. However, these studies focus primarily on the coastline, with an emphasis on the terrestrial aspect of these spaces. This presentation will extend the idea of petroleumscape to the underwater environment. Throughout the 1970s, the Texas Coastal and Marine Council sought to increase fish stocks by building artificial reefs. Building these reefs required attention to the petroleumscape. This meant taking into account both the natural and built environments that supported the discovery and movement of oil in and out of the ports. These include natural structures, such as salt domes and other geological indications of possible oil fields, as well as human-built infrastructure like shipping lanes and oil rigs. Using the example of the Texas Gulf, I will examine how stakeholders sought to increase fisheries while prioritizing and eventually, concretizing the petroleumscape.

Sculpting Coasts for Fisheries: Oceanography for Marine Ranching in Postwar Japan ***Lijing Jiang, Johns Hopkins University***

In the 1960s, Japan's long-standing commitment to improving fisheries extended to coastal infrastructural improvement as both an experimental and an aspirational plan for creating abundant coastal biological resources. Marine ranching, which involved releasing juvenile fish or crustacean larvae into the ocean, was paired with physical engineering of the coasts that included construction of coral reefs. This talk shows that the rise of Japanese coastal oceanography in service of economics, fisheries, and tsunami prevention made these built infrastructures imaginable in the 1960s. At the same time, the Kyoto school of ecology expanded to coastal analysis. Often taking advantage of measurement tools built for physical oceanography, fish ecologists learned about the boom and bust of fish communities in relation to coastal fauna, flora, and the physical parameters of ocean waves and seafloor conditions. Their work highlighted important factors such as nutrition levels, seagrass beds, other physical features of the seabed, and industrial pollution that affected dynamics of fish activities. Because there was little prospect for pollution to cease based on the welfare of the fish, the modification of the physical features of the coast became a priority. The term satoumi was adopted to describe the method of increasing coastal productivity and biodiversity through human intervention, suggesting a harmonious relationship between people and the sea, couched in a context of aggressive rebuilding of the coasts.

Session Organizer:

Helen Rozwadowski, University of Connecticut

Chair:

Helen Rozwadowski, University of Connecticut

137. The Circulation and Transformation of Knowledge in East Asia: A Transnational Approach

Organized Session

9:00 to 10:30 am - Sunday 16 Nov.

Sheraton New Orleans: Floor 3rd Floor - Napoleon B2

The field of the history of science has witnessed a knowledge turn in the last decade. Beyond the concern for westernized knowledge of nature, the history of knowledge recognizes the significance of a wide range of knowledge traditions and practices, such as ancient Chinese medicine and local weather-forecasting experience. It emphasizes knowledge is not fixed but is always in flow and embedded in larger cultural and social contexts. This sets tasks for historians to inquire how knowledge circulated across national boundaries and how it transformed, and was transformed by, the nation's politics and culture. Responding to the call for a global approach to history, this session examines the circulation of knowledge in East Asia from a transnational perspective and unpack the dynamic nature of knowledge through its interactions and negotiations with the region's socio-cultural setting. By tracing the Peking Union Medical College Library's evolving collection strategies, Yinghua Luo reveals that the library's dual role, as a facilitator of Western medical system and a promoter for Chinese medicine modernization, distinguished it from its American counterparts. Through an examination of agroecological knowledge exchange between China and the United States in the 1980s, Xinrui Zhang concludes that although Chinese scholars took a different approach to agroecology, they did incorporate the field's concern for the Global South and worked to apply the knowledge in Africa. Longkai Zang's contribution considers knowledge of human evolution in Japan's context by focusing on the terminology of Japanese scholars and writers, arguing that their perspectives and agendas had shaped the usage of different terms. My own article investigates how Western technologies for weather modification gained strength from, and was translated into, the socialist context during the Mao era, highlighting the role of the state in knowledge-making. Despite a diverse of topics, the session furthers understanding of knowledge landscape in East Asia from a comparative perspective.

Participants:

A Transcultural Knowledge Hub: The Peking Union Medical College Library and the Shaping of China's Modern Medical

System (1920s-1940s) ***Yinghua Luo, Nankai University***

This paper explores how the Peking Union Medical College Library (PUMCL) transformed from a Western-centric medical repository into a hybrid knowledge space through its evolving collection strategies. Initially modeled on Johns Hopkins' library-centric system, the PUMCL housed East Asia's largest multilingual medical collection (over 450 different journals in 8 languages) standardized via (by?) the Boston Medical Library classification. Its interlibrary loan network spanned from Shenyang in the north to Shanghai in the south. A pivotal shift occurred in the 1930s: the library's Division of Chinese, diverging from its earlier exclusion of ancient Chinese medicine, systematically acquired over seventy rare Ming-Qing medical manuscripts, notably those of imperial physician Li Jun's (力钧). This strategic integration of ancient Chinese medical texts enabled PUMC's pharmacological breakthroughs in herbal research, exemplifying Western medical institutions' localization in China. Comparative analysis with U.S. counterparts reveals PUMCL's uniqueness: while American libraries focused on consolidating biomedical authority, PUMCL became a laboratory(or hub?) for synthesizing global medical knowledge. Its dual role—as a conduit for Western medical systematization and an incubator for ancient Chinese medicine modernization—mirrored China's broader epistemic negotiations. The library's transition from cultural transplantation to selective hybridization, which was embodied by its parallel development of Western journals and Ming-Qing medical canons, redefined medical librarianship as a transcultural practice. Through an effort to integrate colonial-era biomedical hegemony and indigenous knowledge revival, the PUMCL not only sustained its research excellence but also pioneered a distinctive Sino-Western medical epistemology that had reshaped modern China's medical landscape.

Agroecological Knowlegde Exchanges Between China and the United States, 1980-1990 ***Xinrui Zhang, East China Normal University***

Agroecology emerged in the 1970s amidst the global wave of environmentalism. In the United States, scholars of agroecology criticized the Green Revolution's technology-centered paradigm through their fieldwork in developing countries, shaping the discipline from the outset both as an academic inquiry and as a critique of mainstream agricultural models in the Global South. Following the reform and opening-up period, China, supported by Sino-American scientific cooperation and the Food and Agriculture Organization of the United Nations(FAO), integrated agroecology with local practices. This led to the development of a unique system that combined systematic theory, computer technology, and rural indigenous knowledge. This article traces agroecological knowledge exchange between China and the United States, with a particular focus on scholars in related fields such as Luo Shiming, and analyzes the interactions and divergences of the two countries in the early development of agroecology. Drawing on interviews with key Chinese and American agroecologists, institutional archives from South China Agricultural University, and FAO documents, this study finds that China did not passively received American theories but actively sought their technological application and the state's policy support. This made China's agroecological trajectory distinct from that of the U.S. focusing on social the critique of capitalism and industrialization. However, Chinese scholars did inherit a strong concern for the Global South and established the China International Training Center for Agriculture that helped promote ecological farming practices in African countries. This history demonstrates how an emerging discipline was shaped through mutual influence and adaptation amid the shifting landscape of Sino-American relations and global leftist thought in the early reform

era. It also sheds light on how China rapidly integrated into global knowledge systems during reform and opening-up, while simultaneously promoting the localization and practical application of academic disciplines through top-down institutional support.

Genjin and Enjin: Culture-Laden Terms in Human Evolution in Japan, 1890-1947
Longkai Zang, Stanford University

This research examines the conceptualization and interpretation of the terms enjin and genjin in Japan's discourse on human evolution up until 1947. By focusing on the terminology, the research aims to uncover how Japanese thinkers and public writers accommodated the theories of human origins and the evidence of early hominids, charting the evolution from conventional beliefs to modern scientific interpretations. The indigenized terminology demonstrates how fossilized human remains were classified and how early human concepts were represented in academic and mainstream narratives. This study unravels the cultural significance of enjin and genjin within the broader context of human evolutionary theory in Japan. As knowledge of human evolution expanded in Japan, enjin emerged as a new term representing the concept of the missing link, specifically associated with the fossil species Pithecanthropus. Genjin found renewed relevance in sociological discussions about early human societies. The perception of enjin as a blend of saru (ape) and hito (human) was heavily influenced by the cultural imagery of the saru, with the Japanese macaque's prominence in Japan shaping this understanding more than the concept of apes. This research analyses a diverse range of sources spanning from newspapers, journals, books to scholarly articles in NDL database. This research highlights the varied interpretations of pekin-enjin and pekin-genjin within Japanese scholarly discourse on Peking Man, from its more animal-like traits to its human qualities. This diversity of viewpoints underscores the fluidity of scientific terminology and how it mirrors broader cultural and intellectual trends. I contend that enjin and genjin are more than mere labels; they are critical analytical instruments that Japanese academics and authors employ to articulate their unique perspectives.

Session Organizer:
Fanqi Xu, UMass Amherst

Chair:
Fanqi Xu, UMass Amherst

138. Rethinking Critique and the Making of 20th-Century Science

Organized Session
9:00 to 10:30 am - Sunday 16 Nov.
Sheraton New Orleans: Napoleon B3

This panel centers on critiques of science in the 20th century, arguing that such challenges were not merely external to the scientific enterprise, but also generated from within its own ranks. Our goal is to examine how scientists and scholars alike have sought to make sense of the role of technoscience over the course of the 20th century, particularly in relation to its entanglements with capitalism. In doing so, the panel foregrounds the intertwined histories of science and its self-reflective discontents. The papers presented here speak to overlapping but distinct moments in which science was made visible as a political, economic, and laboring activity. Through a reconstruction of mid-century Marxist materialist historiographies, an examination of the political transformation of an émigré scientist involved in the U.S.-based radical group "Science for the People," an analysis of the group's rise, fall, and recent revival, and a reappraisal of British challenges to the organization of the laboratory, the panel invites us to reimagine scientific practice in both its everyday operations and its radical potential. These papers thus attend to moments of dissonance when dominant epistemologies fractured and alternative visions of what science is, and whom it should serve, came into view. Taken together, this panel offers a set of historiographical interventions at a moment when renewed attention is being paid to science's entanglements with society. Amid simultaneous calls to defund science and urgent appeals to defend it, there is a pressing need to reconsider

the role of critique in the history of science—echoing Bruno Latour's provocations in "Why Has Critique Run out of Steam?" (2004). The papers in this panel thus revisit historical moments when actors sought not only to challenge scientific authority, but also to reimagine its liberatory possibilities. In this light, critique emerges not as a rejection of science, but as a constitutive part of its production.

Participants:

Mechanical Philosophy and the Transition to Capitalism ***Harun Küçük, University of Pennsylvania***

In this paper, I will reconstruct the historiographical landscape of mechanical philosophy in the first half of the twentieth century. Mechanical philosophy then was central to discussions on the transition to capitalism, the emergence of modern science, and to the relationship between scientific theory and practice. Franz Borkenau's "Übergang vom feudalen zum burgerlichen Weltbild" provided a total package for the emergence of European modernity, including a controversial connection between mechanical philosophy and manufacture in the seventeenth century. The most famous critique came from the economist Henryk Grossman, who worked on his review of the book in Paris as part of the Frankfurt School in exile. Borkenau and Grossman both adopted a materialist, practice-oriented interpretation of what modern science was and how it related to capitalist modernity. But, this conversation also occasioned a reaction among proponents of a theoretical genealogy for modern science and an understanding of modernity that did not involve capitalism. Alexandre Koyré's "Les Philosophes et la Machine" was a rebuttal of the materialist interpretation as was E.J. Dijksterhuis's "Mechanization of the World Picture." I will conclude with some reflections on the narrative parallels between accounts of the Scientific Revolution and accounts of the transition to capitalism.

Scientists at Work: British Radical Science and Materialist Critiques of the Laboratory ***Claire Ann Votava, University of California, Los Angeles***

This paper reconsiders the British radical science movement by examining how it challenged the organization of the laboratory as a site of labor production — seeking instead to reconfigure its material foundations and democratize scientific work. Focusing on the British Society for Social Responsibility in Science (BSSRS), I trace how critiques of scientific authority in the long 1970s were shaped by earlier Marxist and Soviet-influenced visions of science as a social practice. Rather than situating radical science solely within histories of the Cold War or the British New Left, I argue that its conceptual foundations lie in the work of the 1930s "Red Scientists," particularly J.D. Bernal. Bernal's "The Social Function of Science" (1939), written in the aftermath of the Second International Congress of the History of Science and Technology (1931), reframed science as labor and likened the laboratory to the factory floor. His call for democratic control over scientific institutions and a redistribution of resources would echo, decades later, in BSSRS campaigns for scientific reorganization, transparency, and accountability. While Bernal and his contemporaries were deeply influenced by Soviet models of scientific planning, BSSRS members adapted these frameworks to confront emergent forms of technocratic power under neoliberal restructuring. Yet the movement remained marked by contradiction. As university-trained professionals, BSSRS members struggled to reconcile their dual roles as experts and activists. Like their predecessors, they grappled with the tension between rejecting epistemic authority and inhabiting it. By returning to the laboratory as a contested site, this paper highlights the persistence of materialist critiques of science and recasts radical science as part of a broader struggle over knowledge, labor, and collective responsibility.

The Radicalization of a Scientist: Paolo

Strigini's Path from Genetics to Epidemiology through Science for the People ***Sara Meloni, University of Pennsylvania***

Recent scholarship on radical science movements has drawn attention to the transnational networks of people and ideas at the origin of leftist critiques of science and technology, such as in the case of the US-based group Science for the People (SftP). While historians have recognized the alliances established by SftP with movements abroad, the role that émigré scientists played in the US group has received much less attention. This paper explores the career of Paolo Strigini (1929-2008), an Italian geneticist-turned-epidemiologist who was one of the first members of the Boston chapter of SftP. As a militant, he participated in debates over genetic determinism, sociobiology, and recombinant DNA that were expressions of an anti-capitalist, anti-imperialist, feminist, and anti-racist critique of science. Towards the end of the 1970s, Strigini started to question the social usefulness of his own scientific work, ultimately deciding to abandon his successful career in molecular biology. Gradually becoming interested in environmental health and epidemiology, he earned a Master of Public Health and moved back to Italy, where he carried out various epidemiological research projects. Through an analysis of archival documents, published materials, and interviews, this paper reconstructs the political activities organized by Strigini and fellow scientists such as Rita Arditti, Jonathan Beckwith, and Marian Lowe. By focusing on the scientific-political biography of an émigré scientist, my goal is to show the profound effect that radical science activism had in rejecting hegemonic views of science, not only on a theoretical, but also on a personal level.

The Repression and Revival of U.S. Radical Science ***Nayanika Ghosh, Harvard University***

In 2014 the University of Massachusetts Amherst hosted a conference, "Science for the People: The 1970s and Today." Science for the People or SftP was an anti-capitalist organization that emerged in the U.S. in 1969 as part of the protests against the U.S. war in Vietnam. The conference ultimately ignited participants to breathe life into the organization, and a renewed SftP was launched in 2018. In the 29 years between the discontinuation and revival of SftP, however, the professional study of science and society has thrived in the U.S. SftP's battle cry, "science is inevitably political," is moreover hardly foreign to the history of science and STS. Why then, I ask, did radical science have to be revived? The very act of "revival" not only suggests that the history of science and STS have struggled to be "radical" projects but also that radical science failed during the Cold War. The failures of SftP are, specifically, of emerging significance, and recent scholarship has offered scathing accounts of SftP's sexism and its unsophisticated approach to racial justice. While I do not contest that radical science was plagued by problems, such as sexism, elitism, and racism, that afflicted the New Left more generally, in this talk I offer a bold proposition to explain its deradicalization and subsequent collapse in the United States: Radical science was suppressed by state and non-state actors.

Session Organizer:
Claire Ann Votava, University of California, Los Angeles

Chair:
Claire Ann Votava, University of California, Los Angeles

139. Fragility and Resistance: Museum Collections as Living Ecosystems a CALM Caucus Futures Roundtable

Roundtable
9:00 to 10:30 am - Sunday 16 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon C

Museums are often critically viewed as sterile spaces with objects removed from their contexts–as institutions full of "dead things" (sometimes literally, as in the case of natural

history collections). But is this true? This roundtable builds on recent work in the history of science and heritage studies by engaging the museum as a living ecosystem–exploring how collections, specimens, and objects continue to interact with each other, the institution, and its staff long after they've been accessioned. Recognising this, it becomes clear that the ecological wellbeing of collections informs both their metaphorical and material dimensions, presenting a unique relational angle from which to observe and consider their capacity for endurance. Indeed, incorporating the language of ecology into our understanding of museums can allow us to reframe and reassess the problems facing their existence. If we view museums as ecosystems, critical discourse in conservation studies takes on new relevance, particularly considering the future and present impacts of climate change. How might we conceptualize and respond to loss both within the archive and its real-world counterpart? By framing collections as active–and interactive–participants in the functioning (and dysfunctioning) of museums, this roundtable will explore how–if at all–the material fragility of objects, relationships, and knowledge production practices are themselves a site of negotiation and, perhaps, resistance.

Session Organizers:

Elaina Foley, PhD in History at University of Southern California

Nathan Smith, Amgueddfa Cymru—Museum Wales

Chair:

Brant Vogel, Independent Scholar

Participants:

Luis Felipe Eguiarte Souza, Pavek Museum

Kathryn Antonelli, American Philosophical Society

Melanie Rinehart, American Philosophical Society

140. Exhibit Hall Day 3

9:00 to 11:30 am - Sunday 16 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon D

141. Scientific Authority and Accountability in the History of Archaeology

Organized Session
9:00 to 10:30 am - Sunday 16 Nov.
Sheraton New Orleans: Floor 4th Floor - Nottoway

This session will consider efforts to define archaeology as a science in the nineteenth and twentieth centuries. What practices and ideological commitments are considered acceptable, unacceptable, or necessary for scientific archaeology? What benefits should derive from archaeological research, and for whom? Who determines the answers to these questions, and on what basis?

Participants:

Egypt as a Health Resort: Tuberculosis, Lung Trippers, and Antiquities *Kathleen Sheppard, Missouri University of Science and Technology*

The fresh, dry desert air has drawn travelers to Egypt as much as ancient monuments did, from the earliest days of Greek occupation around 330 BCE. Wealthier individuals in the nineteenth and twentieth centuries continued the well-known tradition of the “change of air cure” in Egypt and, frequently, those who took the airs also took interest in the antiquities. They sailed up and down the Nile, in search of their health at first, then in search of ancient artifacts. These lung trippers became known authorities in Egyptology, due, in part. to their debilitating health. Oxford Assyriologist Archibald Sayce traveled to Egypt each winter for almost 30 years (1880s to 1908) to relieve his wet lungs. During that time, he established himself as an expert on the Amarna Tablets and excavated at El Kab, among other things. Trained as an artist in London, E. Harold Jones needed to relieve the symptoms of tuberculosis. He also needed a job. To achieve both, Jones arrived in Egypt in 1903 with a Liverpool expedition at the site of Beni Hasan. Within a few years and until his death in 1911, he was excavating in the Valley of the Kings near Luxor with Americans Theodore Davis and Emma Andrews. His painted copies are the only available records of many tombs excavated during that time. This paper will use the lives and careers of these amateurs-turned-professionals to set the context for a broader discussion about

creating authority in the practice of Egyptology.

"If They're Angry at Us, We're on the Right Track": Soviet Archaeology and the Challenge to Scientific Objectivity in Western Deep-Time Narratives (1928 – 1933) ***Dmitrii Blyshko, University of Houston***

This paper examines the rhetoric of Soviet archaeologists who, between 1928 and 1933, made serious attempts to challenge the European monopoly on scientific objectivity and the construction of deep-time knowledge. In 1928, as war scare hysteria spread across the Soviet Union in anticipation of an attack by European imperialists and a potential social revolution across Europe, Soviet archaeology was mobilized to contest Western interpretations of deep history. Soviet scholars directed their critique at two intertwined concepts—racism and migrationism—which framed human history as a lineage of races migrating across vast territories. From the Soviet perspective, these narratives functioned as rhetorical tools legitimizing impending imperialist invasions. This paper explores the rhetorical strategies employed by Soviet deep-time researchers to undermine not only the objectivity of these concepts but also the very notion of scientific objectivity itself. Instead, they advanced the idea that only political subjectivity—rooted in the correct ideological stance—could lead to true knowledge.

"The Difference between Old Papyri and Tobacco": Science and Smuggling in Interwar Egypt ***Adam Christopher Hill, Greenville University***

This paper will examine how European archaeologists invoked the values of professional, universalized science to justify circumventions of Egyptian law in the interwar period. Discussions of antiquities smuggling in interwar Egypt have tended to either treat it as an established practice or to focus on the controversial excavation of Tutankhamun's tomb as a singular case. In this way, two vital points are overlooked. First, during this period the newly independent Egyptian state was actively asserting its jurisdiction over antiquities, and in the process explicitly emphasizing the priority of scientific standards. Second, prominent European archaeologists took steps during this period to conceal their unapproved removal of Egyptian antiquities—to conceal these activities not only from the Egyptian authorities, but also from their European colleagues. This suggests that they understood such practices to be both illegal and at odds with common European understandings of proper archaeological practice, even as they privately justified their actions on the basis of scientific principles.

Session Organizer:
Adam Christopher Hill, Greenville University

Chair:
Kathleen Sheppard, Missouri University of Science and Technology

Commentator:
Christopher Heaney, Pennsylvania State University

142. Complicating the Role of the State in Central American Health and Wellness, 1900-2020.

Organized Session
9:00 to 10:30 am - Sunday 16 Nov.
Sheraton New Orleans: Floor 4th Floor - Oak Alley

This panel will showcase emerging work on public health and medicine in the Central American region. Panelists' papers ask how we might reframe our understanding of the history of Central America, as well as imperialism, colonialism, revolution, and state power, by analyzing the region through the lens of public health and medicine. Panelists will examine public health as a form of state surveillance and social control, while also highlighting how health has been a site of negotiation, resistance, social solidarity, and struggle. They explore the complex interactions between state, local, and international health organizations in defining who constituted a disease vector, a disabled person, and a criminal. Yet they also show how activists

appropriated medicalized categories to make demands on the state and even take up arms. Central themes include the complex process of knowledge production at the local and international level and the medical pluralism of the region that effectively limited doctors' authority and state power. Although official archives tell a triumphant story of state control, panelists read sources against the grain and draw from oral histories and student publications to tell a more nuanced and complex story about the possibilities and limits of this power.

Participants:

Expanding and Comparing Venereal Disease Surveillance in Guatemala City to Other Infections, 1900-1920 ***Alexandria Herrera, The University of South Carolina***

Through the late nineteenth century and into the mid-twentieth century, Guatemala City had undergone various attempts to control the spread of crime and disease attributed to sex work and brothels in the capital. Guatemalan public health, medical, government, and police officials implemented various levels of medical surveillance to prevent the spread of syphilis and gonorrhea infections. In the late nineteenth century, these efforts primarily targeted mixed-race and Indigenous sex workers. This period was an intense period of state formation in Guatemala. For Guatemalan elites, the success of state formation depended on the labor and exploitation of poor and working-class mixed-race and Indigenous people. A sickly population threatened their vision of an economically and socially progressive, clean, and orderly society. This paper, while keeping in mind the developing framework of venereal disease surveillance in Guatemala City during this period, expands the scope of disease surveillance to examine how other diseases, infections, and ailments of concern to Guatemala City elites, including water and food born pathogens, such as cholera and dystentary, whooping cough, and influenza, at the turn of the twentieth century. Expanding the scope of disease surveillance in the capital at this time to diseases beyond syphilis and gonorrhea allows for examining congruences and differences between disease surveillance outside doctors' examination rooms, and female sex workers' bedrooms, into everyday public spaces, such as the market, the school, and wash basins.

Tracing the Vector: Race, Gender, and Venereal Disease in Early Twentieth-Century Guatemala ***Lydia Crafts, Manhattan College***

In the late nineteenth century, Guatemalan doctors refuted the longstanding myth that syphilis had originated in the Americas. Instead, they argued that syphilis had universal origins: it had been present in both the Americas and in Europe long before the Columbian Exchange. These arguments were driven by a concern over race and nation. They wrote soon after Latin American countries had gained their independence from the Spanish Crown. As Historian Claude Quétel wrote, syphilis had always been a disease of the "other." Nations were quick to stigmatize each other as overrun with venereal disease. Still, the Guatemalan medical community also continued to be haunted by the origins story. It tapped into their anxieties about state building in a country with a majority Indigenous and mestizo population. This chapter traces Guatemalan doctors, military, and police officials' shifting perceptions of who constituted the key vector for venereal diseases in the late nineteenth and early twentieth centuries, and how those perceptions were informed by local and international debates in medicine and anthropology concerning race and syphilis. They at first envisioned the main sources of these diseases to be a working-class mestiza and a sex worker. Yet by the 1920s and 1930s they extended their focus to include Indigenous soldiers. This paper argues that medical doctors' fixations on venereal disease highlight key anxieties about race, gender, reproduction, and state-building in Guatemala during the early twentieth century.

Comparative Lessons from 1918 Spanish

Influenza and COVID-19 in Guatemala ***David Carey, Loyola University Maryland***

The 1918 'Spanish' influenza and COVID-19 pandemics exposed and deepened social inequities and highlighted failures in public health leadership. But those pandemics also revealed local-level social solidarity and Indigenous and other forms of healing in meeting basic needs and facilitating more equitable health care access. Residents drew upon networks of mutual reliance and resilience, and relations with community organizations and healers. With high death rates among rural Indigenous people in highland Guatemala, the vulnerabilities in the two pandemics were strikingly similar. Shared pandemic experiences across more than a century suggest the limits of biomedicine and technological fixes, and the need to pursue deeper historical understanding of sources of resilience in response to health care crises. The ongoing relevance of inequities in understanding health crises, and the limited efficacy of mainstream biomedicine and public health to reach those most impacted by disease outbreaks was apparent in Guatemala. Comparing the pandemics reveals significant differences such as resistance to state interventions during COVID-19 that were absent in 1918, and parallel practices such as staying home with trusted people and centering wellbeing around Indigenous health and hygienic practices. Informed by oral history and archival research, the findings counteract historical erasure of local-level Indigenous and activist epistemologies, knowledge, and experience, and facilitate respecting and implementing them in pandemic recovery priorities. In both pandemics, authorities poorly understood and barely recognized communities' capacity to respond to pandemics. This paper will provide insights into the mechanisms of community resilience in the face of existential and material threats and persistent health inequality.

"Another Reason for the People's Struggle": Disability and the Coming Revolution in 1970s El Salvador ***Heather Vrana, University of Florida***

There were many ways to become disabled in El Salvador in the later part of the twentieth century. To be poor—to experience malnutrition, preventable diseases, debilitation after working sugar cane or coffee harvests, dangerous pregnancies and childbirths, torture at the hands of the National Guard for unionizing or studying Marx or the Gospels—often meant debilitation. Emergent leftist groups included these measures of El Salvador's health panorama in their calls to arms by the late 1970s. One could imagine that they when they shouted, "revolution or death [revolución o muerte]" their meaning was quite literal: they would die without a revolution. But other Salvadorans, like public health officials in government posts or with international research agencies, also identified disabling conditions. Many of them sought to put in place interventions they saw as beneficial. Sometimes they offered meaningful aid. Sometimes these studies and interventions served to stigmatize, surveil, and control particular populations. But they were always politically impactful. This paper is about how public health and sanitation metrics shaped public discourse around debilitation in the years leading up to El Salvador's civil war (1980-1992). It posits that by centering El Salvador's health panorama in their justification for increasingly desperate attempts to create social change, leftists and reformers effectively positioned disability and debilitation were reasons to take up arms. All this was exemplified in a short book published by public university students in 1981 entitled Health in El Salvador: Another reason for the people's struggle [Salud en El Salvador: otra razón para el combate popular]. How do our understandings of revolutions change when we center disabled and debilitated bodies at their origin?

Session Organizers:

Alexandria Herrera, The University of South Carolina
Lydia Crafts, Manhattan College

Chair:
Alexandria Herrera, The University of South Carolina

143. GECC Welcome Room Day 4

9:00 to 11:30 am - Sunday 16 Nov.
Sheraton New Orleans: Floor 3rd Floor - Poydras
Graduate and Early Career Caucus Welcome Room

144. Maternal and Fetal Health in the History of Science

Contributed Paper Session
11:00 to 12:30 pm - Sunday 16 Nov.
Sheraton New Orleans: Floor 4th Floor - Bayside ABC

Participants:

Contested Choices: The Fetus & Bodily Politics in Nineteenth-Century Spain *Mary Kate Wolken, University of Minnesota*

My proposed paper centers on the death story of Angela Fernández, a Galician woman who died in 1844. I argue that the criminal case stemming from Angela Fernández' death reflects the shifting religious and secular politics of childbirth and the value of the mother and fetus/infant in nineteenth-century Spain. As her family and neighbors desperately called for a surgeon who could never have arrived in time, Angela repeatedly begged for them not to allow "the operation." Despite the obvious complications that killed both mother and fetus, local authorities opened a criminal investigation–nominally into the death of the mother, but as the case progressed, the death of the fetus became the subject of inquiry. Angela's body was the critical repository of evidence in the case that allowed investigators to conclude that the midwives' attempts to save the mother ruined any chance of saving the fetus. I examine why a local official initiated and justified this criminal case, investigated against the wishes of the deceased's family; the significance of the autopsy evidence over witness testimony about Angela's insistence against surgical intervention; and upon which bodies state and scientific-medical interest was inscribed. I contextualize this case through an analysis of published Spanish legal-medical texts that describe practitioner duties in birth and gynecological care. I also integrate transatlantic discussions on "sacred embryology" which redefined notions of fetal life and maternal sacrifice. This project elucidates the ongoing history of institutional power on women's personal health experiences, maternal agency, and surveillance over patients and providers.

Cosmic Wombs and Altered Bodies: Anatomical Practices and the Seven-Celled Uterus Doctrine *Baylee Staufenbiel, Florida State University*

The persistence of the seven-cell uterus doctrine highlights the interplay between belief systems, cosmological paradigms, and anatomical exploration from the medieval to the early modern era. Originating in the Pseudo-Galenic text De spermate (1150), the seven-cell uterus became a simulacrum of the seven heavenly spheres. This symbolic framework overshadowed empirical evidence, as anatomical discoveries were reinterpreted to fit existing cosmological analogies. Despite advancements in dissection, hands-on knowledge was often unable to overcome the authority of traditional medical and metaphysical epistemologies. Preparation and preservation techniques, from Mondino de Liuzzi to William Hunter, shaped anatomical conclusions. As anatomists acted to mitigate rapid decay, they distorted and altered bodily structures, making the study of anatomy more difficult while bolstering frameworks like the seven-cell uterus doctrine. By analysing the intersection of preservation practices and interpretive paradigms, this paper argues that established cultural and medical understandings reinforced cosmological beliefs about the female body.

Negotiating Race and Prematurity in Midcentury American Healthcare *Vivien Hamilton, Harvey Mudd College*

Black and Hispanic infants in the United States are currently more likely to be born prematurely but are also less likely to receive essential treatments including steroids to speed up lung development (Davis 2019, p. 138). This paper aims to uncover some of the historical roots of this medical racism by investigating definitions of prematurity in the 1940s. With a new consensus that any infant born weighing less than 2500 g would count as premature, doctors started compiling statistics on preterm births, and that data revealed significant racial disparities. In 1938, for instance, a study of infants delivered in Johns Hopkins Hospital showed 12% of the “colored” babies were born early, compared to 6% of white babies (Peckham 1938). But just as certain groups of infants became visible as particularly vulnerable, some doctors attempted to deny their existence by introducing a racial dimension into the definition of prematurity. One Cincinnati group proposed that the weight cut off for a full term baby should be lowered to 2300 g for Black infants, arguing (with little evidence) that Black babies simply mature faster and are born smaller than white babies (Brown, Lyon and Anderson 1945). I trace the impact of this argument, examining published medical literature alongside articles in women’s magazines, asking which small babies got to be premature. At stake was access to critical health care, including incubators and blood transfusions, but also membership in a newly constructed social group that included famous premature babies such as Newton, Cuvier, and Darwin.

145. Globalizing Knowledges in Colonial and Post-Colonial India

Contributed Paper Session
11:00 to 12:30 pm - Sunday 16 Nov.
Sheraton New Orleans: Floor 3rd Floor - Borgne
Participants:

The Institutionalisation of the Unani Medical System in the Deccan Region During 19th-Century India *Sai Krishna Vardhaman, IIT Madras*

The origin of Unani goes back to the period of Tibb scholars and Greek philosophers. It was developed during the Abbasid period and introduced in India during the 10th century A.D., received patronage from the Muslim rulers, and became part of medical systems in India. The encounter with British rule marked a pivotal moment as Unani and English medicine coexisted, reflecting distinct cultural norms. Unlike the notion of British colonialism solely dominating Indian medical practices, Unani practitioners strategically navigated the colonial context, incorporating new knowledge communities and positioning Unani as an indigenous medicine open to innovation. The reform of the Unani Tibb was viewed as primarily an engagement with Western forms of knowledge, power, and practice. This paper focuses on the reform, the process, and the nature of Unani institutionalisation in the Deccan Region, as well as how it has continued to act as a hub for its practice. The emergence of colonial models of institutional practice did not lead to a complete reconfiguration of the authoritative loci of Unani Tibb. The exchange between regions and the adaptability of Unani across different medical frameworks reveals that concepts of medical modernity and professionalisation are context-specific and not universally Euro-centric. This paper challenges the popular notion of the rise in people’s resort to allopathic drugs and attendance at Western medical dispensaries during the late 19th century with the popularity of midwifery practised through Unani dispensaries. Colonial medicine, which tended to be monopolistic, was forced to accept pluralism in many tropical worlds.

Science in the midst of Theosophy: The Central Hindu College of Benares (1898-1916) *Dr. Ritesh Gupta, Assistant Professor*

This paper explores the Central Hindu College (C.H.C.) of Benares as a notable example showcasing that modern science was not merely transplanted into colonial India as a Western import but was redefined and integrated within the Indian cultural and intellectual traditions. The study delves into the college's founder, Annie Besant educational philosophy, particularly her approach to combining science and technical education with moral education embedded in the teachings of the Hindu religion to create an educational system that catered to the needs of Indian society under British rule. The paper highlights the intellectual exchanges at C.H.C., where traditional Hindu scientific knowledge, especially its mathematical and medical learning, was interwoven with modern scientific education, reflecting a broader trend of cultural nationalism and revivalism. A special focus is given to the early years of science education at C.H.C., particularly the achievements of its chemistry department, which thrived due to the theosophical underpinnings of the college. Besant's interest in occult chemistry—a subject that intrigued even contemporary scientists—is also examined, adding a layer of complexity to the understanding of how science was perceived at the college. Furthermore, the discourse of technical education, which recognises its intrinsic relationship with industrial development, is also discussed. This discourse was reflected in the pages of the college magazine, illustrating the broader ambitions of C.H.C to contribute to the economic and industrial development of India by establishing a Technical Institute. This study, in toto, seeks to address the significant gap in understanding how modern science, often viewed as a Western import, was reinterpreted and integrated within the cultural and intellectual traditions of colonial societies like India. The study is particularly relevant as it contributes to a global understanding of how 'national' institutions established in colonies mediated modern science. The findings hold significant implications for comparative studies on the institutionalisation of modern science in other Western colonies across Asia, Africa, and South America. By situating the C.H.C. within the broader discourse of science, religion, and industrialisation, this study provides a valuable framework for exploring the science and technical institutions established in colonies of European nations and the impact of modern science in diverse colonial contexts.

Decolonizing Medical Knowledge in Postcolonial India ***Arafaat Valiani, University of Oregon***

Interpreting medical journals, books, and newspapers, this paper traces imaginings of the infrastructure that would archive medical data in postcolonial India. Focusing on shifting views on the use of genetic data, I demonstrate how efforts to bring preventative care to the Indian middle class and marginalized Adivasi communities in the 1960s and 1970s motivated Indian geneticists to create a network of labs and education institutions in which genetic samples (i.e. blood) could be collected, studied and analyzed. Next, I suggest that obstetricians and gynecologists came to the forefront of defining India’s approach to using genetic data for medical treatment in the 1980s and thus emphasized the need to adopt blood collection and storage practices that facilitated the adoption of genetic pre-screening technology which their counterparts in Europe and the United State utilized. This paper contributes perspectives on data history in India which build on the scholarship on science and medicine in modern South Asia. It also offers a global perspective to scholarly—and broader transdisciplinary—debates about strategies to decolonize biomedical and health research.

146. Biography and Causation in the History of Science

Contributed Paper Session
11:00 to 12:30 pm - Sunday 16 Nov.
Sheraton New Orleans: Napoleon A1
Participants:

Giordano Bruno, the Problem of Continuity, and the History of Scientific Method
Gregory Banfield Moynahan, Bard College

Giordano Bruno remains a contested figure in the historiography of science. On one hand, he has been celebrated as the "first philosopher of Copernicanism"—a heroic precursor to Enlightenment rationalism and a pivotal figure for historians of science such as Hans Blumenberg, Ernst Cassirer, and Alexandre Koyré. On the other hand, following the influential interpretation of Frances Yates, Bruno is often positioned primarily as a Renaissance mystic whose estrangement from mathematical reasoning disqualified him from serious contributions to natural philosophy. This talk revisits Bruno's scientific and philosophical reception with a view to reinterpreting his role through the lens of the problem of continuity. I argue that his distinctive treatment of continuity—cosmological, epistemological, and ontological—provides a productive framework for understanding his lasting relevance to the development of scientific reasoning. Bruno advanced core implications of Copernican cosmology not through empirical observation or quantitative analysis, but by interrogating the metaphysical and imaginative conditions under which continuity could be conceived in an infinite, centerless universe. His claim in De la causa, principio et uno that "through the senses we reach the intellect, but through imagination we reach being itself" encapsulates his philosophical method: one that neither rejects sense experience nor dissolves it into abstraction, but instead seeks a mediating function in imaginative reason. By tracing Bruno's theory of imagination in connection with Renaissance debates on method, sufficiency, and hypothesis, I show that Bruno illuminates a distinctive pathway through—and beyond—both empiricism and idealism.

The Historian and the Physicist: Albert Einstein, Lucien Febvre, and the Discussions about Time and Causation at the Centre International de Synthèse.
Elena Aronova, University of California, Santa Barbara

In his "meditation" on the occasion of Albert Einstein's death, Lucien Febvre, the founder of one of the most important schools of historiography of the twentieth century, mused on a number of reasons the historians should familiarize themselves with Einsteinian theory of relativity and try to stay abreast with the implications of "new physics." Writing at the height of the Cold War, the seventy-seven-year-old historian warned new generation of historians that the stagnation of the historians' mental tools could lead, if not addressed, to nothing less than the ruin of modern civilization, the very subject to which he devoted his illustrious scholarly career and his teaching. Febvre, however, did not elaborate on the ramifications, direct or indirect, of Einsteinian physics for the historians' craft that he treated as no more and no less than a question of survival. This paper recovers the specific context of Febvre's encounter with Albert Einstein's ideas: the series of interdisciplinary seminars he co-organized in the aftermath of Einstein's visit to Paris in 1929 at the Centre international de synthèse in Paris. Febvre's involvement in the Center's "weeks of synthesis" in 1930 and 1931, as a co-organizer of both "weeks" and as a presenter in the latter, along with the comments he left on both events in his correspondence, gives an opportunity to place his "meditations" into historical context, and to explore the impact of Einstein's ideas on the historian's thinking about time as a framework for history, and about historical causation through time.

Contingencies and Regularities: Julian

Steward and the Ecological Foundations of Culture ***Emilie Josephine Raymer, Harvard College***

In this talk, I focus on anthropologist Julian Steward's concepts of cultural ecology and multilinear evolution. While scholars have recognized that human ecology emerged as a significant discourse in the mid-twentieth century, they primarily have focused on the "Chicago school" and have examined how sociologists like Robert Park, Ernest Burgess, and Louis Wirth analyzed demographic patterns in urban environments. However, Steward's work suggests that we have overlooked some of ecology's larger methodological and theoretical significance for scholars in the twentieth century. As I emphasize, if we situate cultural ecology within the broader intellectual context in which it developed, we can see that human scientists like Steward were frustrated with the historical particularism and Boasian relativism that they perceived to dominate social scientific methodology during this period. According to Steward, these approaches seemed to deny a bridge between the biological and social and seemed to discount the material and environmental conditions that influenced cultural development. For Steward and others, ecology provided a bridge between nature and culture, as well as a framework for thinking about how within communities there could be flux, diversity, and dynamism and lawlike processes that shaped community structure and development. Indeed, Steward was primarily interested in the cross-cultural regularities in how societies adapted to their environments and how cultural practices created unique developmental paths. In this talk, I examine these contributions to anthropology and the major developments in ecology, biology, and evolutionary theory on which he and others drew.

147. Thinking with Birds

Contributed Paper Session

11:00 to 12:30 pm - Sunday 16 Nov.

Sheraton New Orleans: Floor 3rd Floor - Napoleon A2

Participants:

André Thevet's Ascension Island Aponar as the Confluence of Auks and Penguins ***Seán Thomas Kane, Binghamton University***

A common confusion between the great auk (Pinguinus impennis) and penguins (Spheniscidae) persists owing to their similar appearance and oceanic habitats. Yet their taxonomic confusion stems from André Thevet's identification in 1555 of an unknown flightless bird on Ascension Island that looked like an auk as an aponar, borrowing from Jacques Cartier's adoption of the word apponath, an indigenous Beothuk name for the great auks he hunted in 1534 on Funk Island off the Newfoundland coast. In this paper, I make an effort at clearing up this confusion, first by addressing the nature of penguin accounts in the works of other early sixteenth century South Atlantic explorers, and secondly by comparing different penguin species to the extinct Ascension night heron which is popularly considered to be the bird Thevet saw to come to a conclusion about which bird his Ascension aponar actually was. This paper uses a new methodology that I have developed called historical zoology to use modern biological, behavioral, environmental and zoological studies to identify historic animals. While the result of this study is inconclusive for lack of zoological data, it still proves that this methodology can work. It demonstrates the value of sixteenth century eyewitness accounts to natural history and the history of zoology in particular.

Birding in the Visual Archives: The Mystery of the "Ash-Coloured and Red Parrot" ***Deniz Martinez, University of Delaware***

In 1736, British naturalist George Edwards painted a portrait of a pet parrot that in all aspects appeared to be an African Grey Parrot (Psittacus erithacus), except for the fact that the usual gray body plumage was instead mottled gray and red. He published the image along with a description,

dubbing it the “Ash-Coloured and Grey Parrot.” Several more depictions of similarly plumaged parrots subsequently appeared in Europe, some with accompanying descriptions suggesting such individuals were not uncommon at the time. And yet, the visual record of this type seems to disappear by the end of the 18th century, with the exception of a single late 19th century entry. However, that last image also accompanies an ornithological text claiming the bird was, in fact, a distinct species. In modern times, such parrots are only known in aviculture as African Grey Parrots that are either the result of “red factor” genetic mutations (who are then selectively bred to develop highly sought after red factor varieties), or as the result of “red suffusion,” a condition believed to be caused by poor diet and/or liver disease. So then, what were these other parrots who appeared then seemingly disappeared during the course of 18th century European avian collecting? Were they, in fact, a now lost (sub)species driven to extinction by colonial pressures? Did they just have aberrant plumage due to red factor mutations, making them targets for collection as novelties? Did the plumage develop in captivity due to poor keeping? Were they, as one source suggested, evidence of tapirage practices in Africa? This paper presents my found image collection of these mystery parrots and, along with the accompanying textual evidence, considers these various possibilities, along with how this case can connect to broader questions in the study of avian colors in both nature and art.

“Hurting the Carrion-Crow: Early Caribbean Vulture Knowledge & Aphoristic Vernacular Science” ***Jacob Myers, University of Pennsylvania***

In the torture diaries of Jamaican overseer Thomas Thistlewood (c.1748-1768), he records a seemingly opaque aphorism about the turkey vulture: “If you hurt a Carrion Crow or her eggs, you will never be well until they be well, spoil’d or dead.” An avid collector of proverbs and other adages, Thistlewood records the vulture aphorism during a period when he had not yet been fully formed by plantocratic assumptions about the value of Afro-Caribbean knowledge nor when he could understand all the resonances of their speech. At the same time, the aphorism’s concision exemplifies the problems of interpretation in the archive of enslavement, where scholars navigate frustratingly brief mentions of Black life in ledgers, inventories, wills, and other documents that center enslavers’ worldviews. Analyzing the aphorism’s placement in Thistlewood’s diaries and its socio-ecological context, I argue the turkey vulture adage’s hermeneutic inexhaustibility demands reconceptualizing the content and form of the early Caribbean archive writ-large to center women’s environmental-spiritual knowledge. In this presentation, I expand the gendered histories of bird hunting and sexual violence against enslaved women – including Thistlewood’s own assaults – encoded in the aphorism’s discursive network. In doing so, I show how analyzing the aphorism as a mobile, emblematic form presents new opportunities to integrate Afro-Caribbean vernacular knowledge into the history of science.

For Bird Flight to be Mechanical: Scientific Challenges and Pragmatism in Shaping Aerodynamics, 1860s-1900s ***Shinhye Jang, Seoul National University***

This paper examines how the science of flight was investigated within the context of nineteenth-century natural science, before modern aeronautics emerged. Engineering science is necessarily rooted in technology; without technological artifacts, it becomes difficult to define engineering research problems. In the nineteenth century, prior to the airplane, aeronautics was an interdisciplinary project that united the study of birds, air, and potential flying machines under the name of science. Drawing on international and cross-disciplinary discussions, particularly those from the Aeronautical Society of Great Britain, this paper explores how aeronautical scientists framed bird flight as

a “mechanical problem” to gain scientific recognition. While the history of nineteenth-century aeronautics often highlighted bird-inspired designs, aeronautics was equally concerned with uncovering the physical principles underlying avian motion, employing both empiricism and selective application of mechanical laws. The paper also examines the pragmatist basis of Samuel P. Langley’s aerodynamics, known as Langley’s Law, which rejected traditional hydrodynamic concepts in favor of a new branch of aerodynamics distinct from fluid dynamics. This proposition initially faced resistance from the English scientific community, particularly from Lord Rayleigh. By examining the aerodynamics of the pre-airplane era, this paper shows that aeronautics, once undifferentiated between the pure and applied sciences, gradually evolved into an engineering discipline. Ultimately, the scientific study of bird flight lacked the ability to achieve powered flight; it was the invention of the airplane that enabled a coherent scientific framework for aerodynamics to emerge.

148. Aquascaping: Knowledge and Infrastructure in Global River History

Roundtable

11:00 to 12:30 pm - Sunday 16 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon A3

While rivers have long-standing pride of place in environmental history, historians of science have given less attention to rivers as sites of knowledge production or indeed as collaborators in the knowledge-making process. Drawing on our research sited in East Asia, the Arctic Circle, Europe, Latin America, and the United States, this roundtable will stage a cross-disciplinary conversation about rivers, knowledge, and infrastructure by opening up questions such as: How has listening to water infrastructure along the Los Angeles River shaped Angelenos’ imagined ecologies? What do dead rivers and abandoned water infrastructures conversely do for ecological memory in agri-business landscapes in contemporary Mexico? How did Chinese engagements with Jesuit meteorology produce new ways of knowing and visualizing the Yangtze River? Failed attempts to drain the Zijpe River in the early modern Netherlands and Indigenous opposition to a U.S. project to dam the Yukon River invite us to ask: How have efforts to engineer rivers been thwarted by other human and non-human actors? Finally, through considering French colonial readings of the crawfish and other “river-dwellers” who inhabited the floodplains of the Mississippi in and around New Orleans, we invite roundtable participants and attendees alike to reflect on the significance of the place where we are gathering and the many makers of knowledge who have historically gathered there.

Session Organizer:

Lydia Barnett, Northwestern University

Chair:

Lydia Barnett, Northwestern University

Participants:

Alexandra Hui, Mississippi State University
Bathsheba Demuth, Brown University
Braden Scott, University of Manitoba
Gabriela Soto Laveaga, Harvard University
Katherine Mary Ibbett, University of Oxford
Lihong Liu, University of Michigan

149. New Approaches to the History of Science in Premodern and Imperial China

Contributed Paper Session

11:00 to 12:30 pm - Sunday 16 Nov.
Sheraton New Orleans: Napoleon B1

Participants:

From Deity to Digestive Aid: Acorus Species in Chinese Literature and Medicine *Sean Bradley, Independent Scholar*

Acorus species are used in Traditional Chinese medicine with references going back to the earliest materia medica, the Shennong bencao jing 神農本草經 (Divine Farmer’s canon of materia medica), complied between the first and second centuries CE. The roots of the plant continue to be used clinically in Chinese medicine for digestive pain, distension, and loss of appetite, but it is also used for more severe conditions such as loss of consciousness and seizures. Early references outside of the medical tradition, such as those found in the early poems of

the Chuci 楚辭 (The Elegies of Chu), attributed to Qu Yuan (d. 278 BCE), and Daoist hagiographies of immortals such as the Liexian zhuan 列仙傳 (Biographies of Immortals), personify Acorus as a deity and elevate these plants to the supernatural. By looking at historical, medical, religious, and literary sources, we can examine the properties of these plants that not only account for its medical use but also explore their entheogenic potential to better understand their deified status in early literature.

The Lunar Apogee and Nodes in Premodern East Asian Astronomy ***Jeffrey Kotyk, Max Planck Institute for the History of Science***

Ancient Chinese astronomy initially viewed the Moon's orbit differently from Greek astronomy, which saw it intersecting with the ecliptic. In China, the concepts of the lunar apogee and perigee—the Moon's farthest and closest points to Earth—remained vague until around 718 CE, when Indian mathematical astronomy, introduced through a translation, first clearly defined these ideas for Chinese astronomers, although they were not widely studied. About a century later, these concepts were reintroduced in a more accessible way and eventually woven into the emerging practice of horoscopy that had been introduced from abroad. Like Indian astronomy, Chinese astronomers treated Rāhu and Ketu—the lunar nodes, or "Head and Tail"—as pseudo-planets, i.e., as moving points along the ecliptic. Uniquely, though, the Chinese also used the lunar apogee in a similar role. Greek horoscopes noted the apogee but did not emphasize its importance, unlike their Chinese counterparts. Understanding the apogee and nodes was crucial for predicting eclipses and their magnitude, but East Asian astronomers remarkably attempted this using a flat-earth model. In contrast, Greek and Indian astronomers, working with a spherical Earth, understood the reality of the Earth's shadow. Chinese astronomers, with their distinct cosmology, had a different explanation for the dark mass obscuring the Moon during a lunar eclipse. Japanese astronomy fully adopted this Chinese system. This paper explores the history of the lunar apogee and nodes in East Asian astronomy, highlighting in Chinese and Japanese contexts the challenges posed by a flat-earth cosmology.

Gnawing on Rocks: A Case Study on Academic Disenfranchisement and Self-Cultivation in Late Imperial China ***Brian Li, University of Cambridge***

Ming and Qing China saw a rapid expansion of the civil service examination system, which led to unprecedented volumes of candidates—and therefore unprecedented volumes of candidates who did not achieve officialdom. While many went on to pursue alternative careers such as teaching, others abandoned their worldly ambitions altogether, focusing instead on the pursuit of immortality. It was also during that lithophagy, the practice of eating stones, emerged as a common literary trope. So-called "fallen scholars" emphasized connoisseurship and eccentricities as a means of highlighting their gentility. Previous scholarship from art history and intellectual history has presented stones as an object of great symbolic importance. However, I argue that this fascination also had roots in Daoist hermetic and medical texts, particularly ones that emphasized the virtues of a "rustic" lifestyle, particularly one wherein followers fantasized about subsisting on a diet of stones. While many of these texts were printed in earlier dynasties, there was a noticeable uptick in their reprinting during the Ming and Qing, particularly in "xiaoshuo" accounts of prodigious people and occurrences. Further analyzing the readership and transmission of these texts reveals how these narratives became the centerpiece of social exchanges among literati, a "commodity" that could furnish evidence of a scholar's refinement. Dietary guidelines figured prominently in these tracts, and lithophagy was a conspicuous example of a practice that could supposedly help scholars obtain immortality; such visions

appealed to academics confronting their rejection by the prevailing Confucian social order. Daoist self-cultivation practices offered a competing knowledge system, and hermeticism represented a grotesque form of ideological escapism. Lithophagy therefore represented an extreme yet idealistic embodiment of this subculture of disenfranchisement that privileged self-cultivation over worldly pursuits.

150. Cells and Systems in 20th Century Medical Research

Contributed Paper Session
11:00 to 12:30 pm - Sunday 16 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon B2

Participants:

"A True Resting Stage After All": Locating Rest in the Cell Cycle ***Angela Yu, University of California, Berkeley***

From Bertrand Russell's 1932 essay "In Praise of Idleness" to Jenny Odell's Silicon Valley-sited How to Do Nothing (2019), writers and activists have long endorsed individual rest for its potential obstruction to the relentless imperatives of capitalist production. Responding to these pervasive oppositions between inactivity and productivity, my paper traces the dramatic reconceptualization of rest in the history of cell and molecular biology. I attend to rest's initial unthinkability and its eventual appropriation within the normative frame of cellular growth and division. I begin with the progression of debates in the 1960s and 1970s which speculated upon the existence of a "true resting stage," its legitimate distinction from growth phases, and the purpose of reserve cell populations in early stem cell research. Why should cells not continuously grow and multiply? As interest shifted towards the molecular mechanisms of cellular development, scientists proposed that so-called "checkpoint genes" enable conditions for essential cellular maintenance and damage repair. Unlike the resting phase, which was figured as a decisive exit from the cell's repetitive cycles of division, checkpoints initiated regular pauses interspersed within the active phases of the cell cycle. Intervals of arrest were not only appropriated as a lab technique but tacitly returned within life's normative frame. I argue that, even at the cellular level, rest was not imagined to be antithetical to productive growth and development, but instead restored as an integral feature of the living cell.

Taming Immunosuppression: Rejection, Tolerance, and Patients' Lives in Thomas E. Starzl's Liver Transplantation Research, 1960-1990 ***Hyung Wook Park, Nanyang Technological University***

Focusing on the American surgeon Thomas Starzl's work for the world's first liver transplantation, I discuss how he reshaped studies of immunological tolerance and "self-non-self" distinction, proposed by two Nobel laureates, Frank Macfarlane Burnet and Peter Brian Medawar. Following their work, Starzl investigated how chemical immunosuppression, which patients must take perpetually, could induce tolerance and prevent transplanted livers' rejection. Yet the immunosuppressants weakened the body's defense against pathogens. Moreover, he often could not distinguish organ rejection from infection, immunosuppressants' side effects, and surgical mistakes. If a liver transplant failed, was it due to immunological rejection, immunosuppression-induced infection, or its other side effects? Or was it because of the lack of surgical skill? He struggled with what Harry Collins termed "experimenters' regress," when he attributed failed transplant to surgical mistakes, whose nature was in turn demonstrated by transplant failure. Unable to induce complete tolerance, Starzl could not thus delineate the boundary of immunological self. However, this issue was resolved unexpectedly. After 1980, some of his patients stopped their immunosuppressants, because of high prices and no insurance coverage. Others faced difficult life courses, including divorce and unemployment, which hampered regular immunosuppressant intake.

Surprisingly, these patients stayed healthy, implying that their bodies “tolerated” transplanted organs, like some animals tolerating pathogens observed by Burnet. As organs were not rejected, there was no need to distinguish rejection from other mishaps. Patients’ bodies, not doctors’ work, opened new lines of immunological investigation. This story broadens our understanding of transplantation since Susan Lederer and Thomas Schlich.

The Transformation of Cystic Fibrosis from a Localized Disease of the Pancreas to a Systemic Disease ***Michelle LaBonte, Purdue University***

In contrast to some well-described situations in which the adoption of new technologies led to broader disease definitions, the shift in framing of cystic fibrosis (CF) from a localized disease of the pancreas to a systemic disease occurred before the availability of a corresponding diagnostic test. CF was initially described in the late 1930s as a distinct disease entity that could be distinguished from other causes of celiac disease (long before its association with gluten) by a characteristic lesion of the pancreas on autopsy. As such, initial diagnostic tests for CF examined pancreas function. For example, the earliest test used a flexible tube to extract pancreatic fluids from digestive juices to test for the presence of pancreatic enzymes needed for food digestion, which were absent in people with CF. Although most of the children labeled with CF by the late 1930s had both respiratory and gastrointestinal symptoms during life, some physicians initially postulated that all symptoms stemmed from changes in the pancreas. However, in a series of publications beginning in the mid-1940s, Boston physician Sidney Farber, best known for his later work on cancer, suggested that CF should be viewed as a systemic disease involving the mucus-secreting organs. Farber’s view was reinforced in the late 1940s when several children with respiratory complications received a postmortem diagnosis of CF even though the disease had been ruled out during life based on a normal pancreatic function test. By the 1950s, physicians increasingly began to view CF as a systemic disease and called for new tests that would reduce diagnostic uncertainty by better identifying those with a wider range of disease manifestations.

151. Early Modern Collections, Modern Museums

Roundtable

11:00 to 12:30 pm - Sunday 16 Nov.

Sheraton New Orleans: Napoleon B3

What happens to the modern history of science and museums when we let our "early modern" objects lead? This roundtable explores early modern collections not simply as precursors to modern museums, but as ontologically unstable spaces where things—and their meanings—resist containment. We therefore call for a re-centering of the early modern "object" within histories and museums of science, attending to their ability to speak across divides. Daniela Bleichmar will discuss how interpretations of American objects in early modern Europe challenge the notion of the collection as a space of knowledge production and problematize the disciplinary boundaries of the history of science. Ashli White picks up those questions for the revolutionary Atlantic world, examining Pierre Eugène du Simitière’s short-lived museum in Philadelphia that when it closed obscured Caribbean inheritances in the history of U.S. science and its museums. Christopher Heaney will reflect on the particular challenge presented by Spanish, Italian, and U.S. collections of "early modern" sacred subjects from the Andes and whether the recovery of modern museums as ritualizing spaces confirms the history of science's interpretive limits, or invites their expansion. Alexi Baker will explore how early modern artifacts can help university science museums to deconstruct, create, enlighten, and inspire - and to acknowledge and move beyond past Eurocentrism and colonialism. Hannah Marcus will conclude by considering opportunities for thinking with early modern objects in our university museums and classrooms from her perspective as a scholar and a museum director.

Session Organizers:

Hannah Marcus, Harvard University
Christopher Heaney, Pennsylvania State University

Chair:
Jean-François Gauvin

Participants:
Daniela Bleichmar, University of Southern California
Christopher Heaney, Pennsylvania State University
Ashli White
Baker Alexi
Hannah Marcus, Harvard University

152. Ethics, Eugenics, and Experimentation in Medical Research

Contributed Paper Session
11:00 to 12:30 pm - Sunday 16 Nov.
Sheraton New Orleans: Floor 3rd Floor - Napoleon C

Participants:

Abraham and Simon Flexner's Academization of American Medicine: Medicine and Academic Freedom 1877–1935 ***Timm Heinbokel, University of Notre Dame***

Discussion of the imprint left by Abraham Flexner on modern medicine commonly refers to Flexner's enthusiasm for the unprecedented success of German experimental physiology in instituting a new model for medical education and research. I argue that Flexner in fact accomplishes a highly selective appropriation of the German model that necessitates two major distinctions. First, instead of arguing—as the Prussian reformers did—for a Kantian scientization of medicine by refashioning the discipline according to the standards of physics and mathematics, Flexner relies on a much more loosely defined, Deweyan scientization of medicine. Second, this rejection does however not keep Flexner from explicitly endorsing the Humboldtian ideal of academic freedom as it is articulated by one of those Prussian reformers, Hermann von Helmholtz, in his famous 1877 'Rektoratsrede,' thereby seeing science advanced only by gifted individuals acting in absolute academic freedom. This credo is articulated with increasing forcefulness by Abraham Flexner after his departure from the Rockefeller Foundation in 1928, and continues to be defended until 1935 by his brother Simon. Contrary to subsequent changes in scientific philanthropy, the Flexners did therefore not push for a specific research agenda, and remained neutral or even reserved regarding controversial figures such as Jacques Loeb. Care must therefore also be taken to differentiate the Flexner vision from the later Weaver vision of biomedical research, with the Flexner vision enjoying a much shorter life-span than what might be suggested by the enduring attention accorded to Abraham Flexner's 1910 report.

Unfit to Reproduce, Unfit to Parent, Unfit to Decide: The Evolving Rationale for Sterilizing People with Disabilities ***Aubrey Allen; Megan Glasmann; Nicole Novak; Lida Sarafraz; James Tabery, University of Utah***

Dozens of states controversially allow for non-consensually sterilizing people with disabilities. For critics, a practice that removes certain people's ability to decide whether to have children harkens back to eugenics and the targeting of people with disabilities as "unfit." For defenders, there's a clear difference between the past eugenic sterilizations and the sterilizations of the present; they proceed now only through an independent review process charged with confirming that a sterilization will be in the patient's best interest, and such process is triggered by a parent/guardian, not a state actor. We draw on a century's worth of state-level legislation to reveal how the rationale for sterilizing people with disabilities evolved over time. What began as an explicitly eugenic practice designed to target those who were deemed "unfit to reproduce" morphed into one aimed at preventing those who were deemed "unfit to parent" from having children they couldn't raise, and then transitioned again to allow for sterilizing people who were deemed "unfit

to decide” for themselves. The history reveals some ways that the contemporary practice is distinct from the sterilization programs of the eugenics era, but also other ways that the sterilizations performed today inherited and continue to share similarities to the past. As more states reckon with their histories of eugenic sterilization by issuing apologies and funding compensation programs for sterilization survivors, getting clear about the historical relationship between the abhorrent past and the controversial present is essential.

Clinical Expertise, Ethical Concerns, and Biostatistical Knowledge in the Making of Soviet Drug Regulator ***Pavel Vasilyev, HSE University***

The paper focuses on the history of the formation and development of the Soviet system of expert scientific evaluation (and more generally, the whole system of decision-making) of the admissibility of medicines. I want to clarify what role in this system, at different stages, was played by medical knowledge, and what the influence of various socio-political and economic factors and health risks for different social groups of the country’s population were. Based on previous research, I hypothesize that the Soviet drug regulation system combined the relative autonomy of individual medical experts with "soft", guiding control of the state and its representatives. Thus, the paper complicates the usual typologies by presenting a kind of a "hybrid" format of combining the private and the state, the expert and the bureaucratic, the scientific and the non-scientific (cf. Hull 2012; Abashin 2015). I also draw on a tradition that views the Russian Empire and the Soviet Union as an alternative path to modernity, not necessarily as an aberration of modernity or as a latecomer to Western democracies (David-Fox 2015). As a specific example of this approach, I consider Soviet biomedicine as having its own culture (Bernstein, Burton & Healey 2010), a separate epistemology and a specific code of ethics that was largely ideological but not always directly controlled by the authorities or the ruling party. More specifically, I want to consider the hypothesis that, from around the mid-1970s, the Soviet system of pharmaceutical expertise became increasingly similar to the American system, consciously and unconsciously borrowing some global practices (especially regarding the role of statistics in the production of biomedical knowledge). Comparing the system that developed in the USSR with the similar systems in Europe and North America as well as studying the transfers and circulations of biomedical knowledge will make it possible to better assess the specifics of Russian institutions.

153. Imperial and “Native” Varieties of Science in Africa

Contributed Paper Session
11:00 to 12:30 pm - Sunday 16 Nov.
Sheraton New Orleans: Floor 4th Floor - Nottoway

Participants:

“He Looked as if he Were Nearly Gone”: Natural History, Masculinity, and Imperial Violence in 19th Century Africa ***Josh Levy, Library of Congress***

In December of 1889, a hulking American warship arrived on the shores of Angola. Armed to the teeth and laden with over 400 military personnel, the U.S.S. Pensacola was officially engaged in a scientific mission: among the crowd were a dozen scientists hoping to get a clear view of a total solar eclipse. For the astronomers, the expedition was a failure marred by clouds, poor planning, infighting, and professional embarrassment. Its naturalists, however, not only mounted a virtual killing spree of local fauna on the Smithsonian’s behalf, but elected to remain in Africa, eventually becoming combatants in the First Matabele War and minor figures in the founding of Rhodesia. Building on recent work by Tomás Bartoletti, this paper uses the stories of William and Arthur Brown to interrogate the intersections of hunting practices, natural history,

masculinity, and imperial violence in the late 19th century.

Radio and the Telegraphic Origins of Broadcasting in Nigeria *Nnamdi Nnake, McMaster University*

When Nigeria launched radio broadcasting in 1935, the Governor, Sir Bernard Bourdillon, described it as a miracle made possible by obscure technical processes, but urged listeners to focus on its benefits and reliability. This perspective may have endured, because the phenomenon of radio has been celebrated for connecting people and places, as well as facilitating the exchange and circulation of information but its links to the telegraph remain an enigma. This paper offers an extensive analysis of telegraphy as radio's underlying technology, assessing both its achievements and shortcomings. It problematizes the trajectory of broadcast technology in Nigeria and makes several original contributions. First, it contends that the telegraphic origins of radio represented much more than an enabler and was decisive in shaping both its capabilities and impact as a tool connecting people and places. Second, it argues that telegraphy was an important bridge between print and broadcast journalism, at once, signaling a break between analog and digital mass communications, and yet, symbolizing continuity as it synchronized the circulation of imperial agendas in both spheres. Third, it examines radio as a technology-in-use and employs user-oriented stage models to call for a re-evaluation of communication technologies in colonial contexts, informed by imperial ideals and yet grounded in indigenous reactions and realities. Finally, it proposes that the lessons learned from the successes and failures of early radio technology, should guide current efforts at developing sustainable mass communication ecosystems that will protect and promote cultures of the Global South.

Reconsidering 'Improved Varieties': Cassava Farmers, IITA and the Politics of High-Yield Production in Nigeria *Aderayo Sanusi, Princeton University*

My paper explores differences in the way International Institute of Tropical Agriculture (IITA) scientists and farmers in Nigeria approached cassava for mass production between the 1960s and 1990s. After launching IITA's Root and Tuber Improvement Programme in 1971, Black African (Covington-Ward 2016; Pierre 2013) and foreign researchers developed what they characterized as 'improved varieties' of cassava which they distributed in local communities through agricultural development partnerships with the Nigerian government and businesses. I examine why and how 'improved varieties' cassava breeding gained more traction than IITA's lesser known 'cassava-based intercropping' research as the technoscientific approach to high-yield crop production even though the scientific varieties were ill-suited for the majority of producers in southwestern Nigeria. I also unpack the emancipatory practices (McCutcheon et. al 2023; Smith II 2023; Garth and Reese 2020; Garth 2020; Reese 2019) of Black Yorùbá-speaking cassava growers and processors that avoided IITA varieties and continued their long-standing practice of intercropping local varieties and other farming techniques most appropriate for their natural environment and artisanal production (Adunbi 2020). Their vernacular knowledge (Tilley 2011) and IITA's 'cassava-based intercropping' research challenged the logic of modern agricultural development (McCann 2007; Kloppenburg 2005) reflected by IITA's 'improved varieties' for industrial agriculture. My work contributes to historical literature on agricultural science as international development (Curry and Lorek 2024), intercropping research (Harwood 2024) and the encounter between the natural sciences and counter-hegemonic knowledge systems (Fullilove 2022).

154. Cold War Convergences of Time and Space

Contributed Paper Session

11:00 to 12:30 pm - Sunday 16 Nov.

Sheraton New Orleans: Floor 4th Floor - Oak Alley

Participants:

Safe Harbor during a Red Storm: Einstein, Oppenheimer, and Bohm at IAS *Jose Perillan, Vassar College*

Albert Einstein, J.R. Oppenheimer, and David Bohm each navigated the fallout from their political activities during the Red Scare of the early 1950s while working at the Institute for Advanced Study in Princeton, NJ. The Institute itself had a fascinating and complicated role to play as it aspired to be a safe harbor for academics. Based on archival research, this paper explores the story of how these three scientists, representing three successive generations of physics, leveraged their respective status and institutional affiliations to navigate a harrowing moment of political repression. Two artifacts at Vassar College's Archives and Special Collections Library related to Einstein and Oppenheimer's political activities have become catalysts for this research project. The first is a petition card signed by Einstein and Henry Wallace that was part of the W.E.B. Du Bois led Stockholm "World Peace Appeal" petition movement. The second is a transcript of an Oppenheimer 1958 lecture given at Vassar College in which he discusses "Knowledge and the Structure of Culture." In both cases, unpacking the context surrounding these artifacts sheds light on Cold War anxieties in the scientific community and the various ways scientists used their institutional affiliations to navigate them.

Molecular Research Configurations in Cold War Science: The Atomic Clock Program at Neuchâtel in the 1950s *Ion Mihailescu, University of Neuchâtel*

The early Cold War gave rise to a new research environment characterized by large national laboratories, sustained military funding, and centralized infrastructure—what has come to be described as the military-industrial-academic complex. While the American model could not be easily replicated abroad, its accomplishments acted as a point of reference and a source of pressure. This paper examines a phenomenon largely overlooked by historians of Cold War science: the new research environment favored not only configurations that mimicked the American model at scale, but also those that shared a structural resemblance. I describe such arrangements as molecular research configurations: tightly coupled institutional constellations—typically involving academia, industry, and public laboratories—whose proximity, functional differentiation, and strategic alignment enabled them to compete in high-stakes scientific domains. Unlike large-scale systems, these configurations did not require vast resources to coordinate, as their constituent relations were localized. While scale helped shape Cold War science, it was not a prerequisite for success within it. The paper focuses on Neuchâtel, Switzerland, where in the 1950s researchers built some of the world's most stable ammonia-based atomic clocks. By the end of the decade, Neuchâtel was internationally recognized in the development of primary frequency standards and was invited to the select committee charged with redefining the second—alongside eight national laboratories from major Cold War powers. The Neuchâtel configuration, formed in the interwar period and composed of three modestly funded institutions—a community laboratory, a cantonal observatory, and a local university physics institute—thrived within this Cold War ecology. This case invites a rethinking of Cold War science by showing how small, strategically organized actors could emulate the performance of Big Science without mirroring its scale.

Bain Gain: The National Academy of Sciences and the Hungarian Refugee Crisis of 1956 *Monique Laney, Auburn University*

When Soviet troops invaded Hungary on November 4, 1956, in response to the Hungarian Revolution, Eisenhower vowed

to help Hungarian refugees in every way possible. As a consequence, about 38,000 Hungarian refugees resettled in the United States under “Operation Safe Haven.” According to the final report of the quickly formed President’s Committee for Hungarian Refugee Relief, “more than half of the employable refugees were professional, skilled or semiskilled workers. Many were scientists and doctors; many more were university students.” This fact led to the National Academy of Sciences (NAS) organizing the first government-supported undertaking to place refugee scientists and engineers in jobs that matched their skill sets and professional experiences. Originally an ad-hoc emergency operation that began on December 16, 1956, the organization soon developed a more long-term sustainable process. In my presentation, I will provide an overview of the NAS endeavor with a focus on its use of Cold War rhetoric in line with the larger U.S. undertaking, its strategies for placing refugee scientists and engineers, and its changing rhetoric from primarily helping refugee scientists and engineers to focusing on their value to the United States by filling its “manpower” needs, which led the organization’s leadership to consider its future role in promoting the immigration of foreign-born scientists and engineers. This discussion highlights the role of the NAS in supporting the immigration of highly skilled immigrants to the United States in the post-World War II era.

155. HSS Elizabeth Paris Lecture

Plenary Session

1:30 to 3:00 pm - Sunday 16 Nov.

New Orleans Pharmacy Museum: Courtyard

Participant:

Rana Hogarth, University of Pennsylvania

PARTICIPANT INDEX