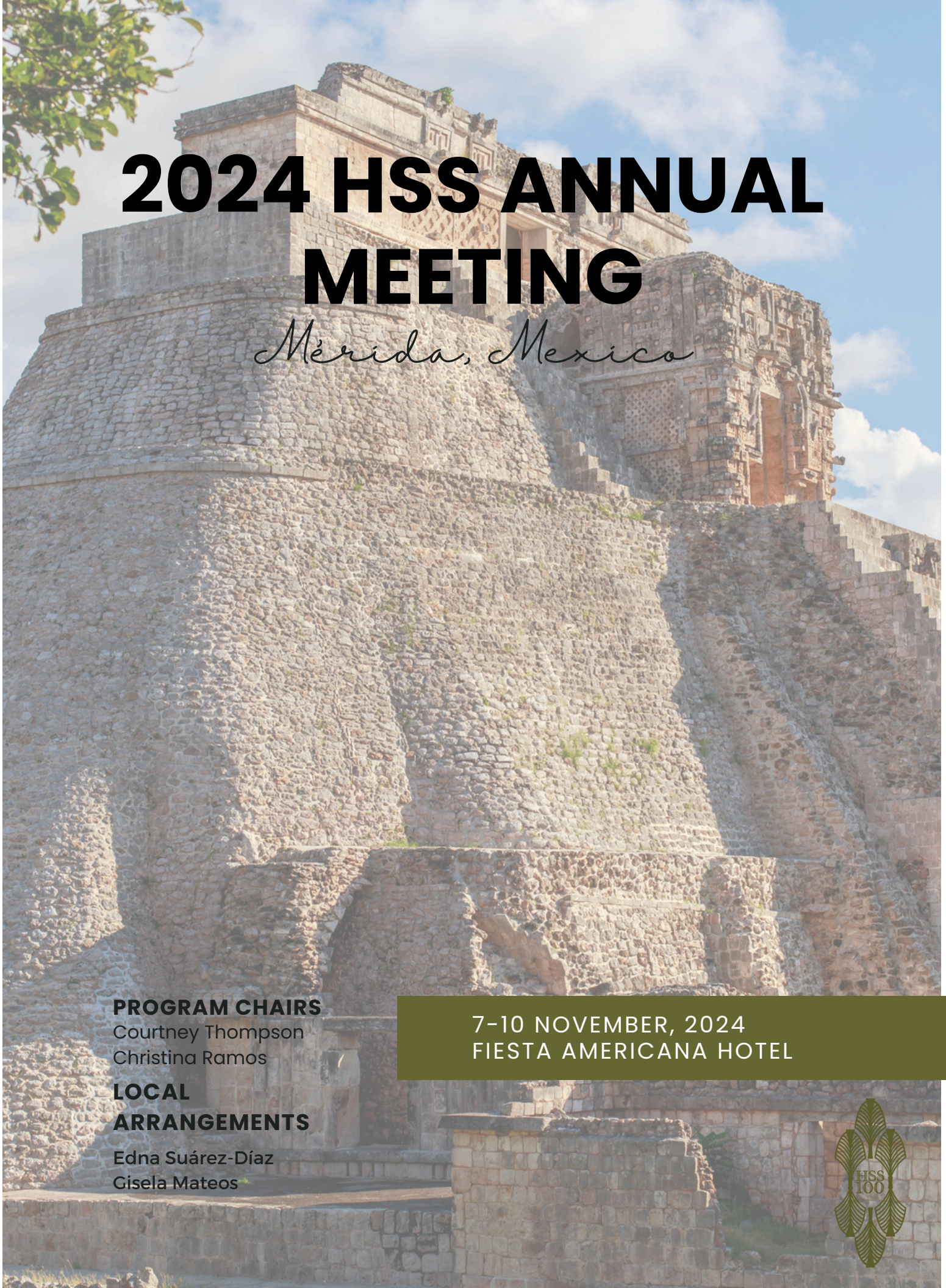

2024 HSS ANNUAL MEETING

Mérida, Mexico

PROGRAM CHAIRS
Courtney Thompson
Christina Ramos

LOCAL ARRANGEMENTS
Edna Suárez-Díaz
Gisela Mateos

7-10 NOVEMBER, 2024
FIESTA AMERICANA HOTEL

MONDAY, OCTOBER, 7

001. Science, Empire, and the Americas

Contributed Paper Session
12:00 to 1:30 pm
Virtual Session: Virtual Room 1
Participants:

Zoological Images as Markers of the Columbian Exchange: Endemic American Animals in 16th Century European Art ***Deniz Martinez, University of Delaware***

Columbus' voyage of 1492 is recognized as a crucial turning point in world history, for it marked the initiation of early modern European contact with – and prompt exploitation of – the so-called "New World" of the Americas. European colonization did not just impact Indigenous peoples and physical lands, however – huge quantities of native fauna and flora were exported from these regions as well, many of which today find themselves imperiled or even extinct. Images of species endemic to the Americas, and thus previously unknown to Europeans, can therefore provide valuable data for tracking the establishment and expansion of the post-1492 transatlantic trade known as the Columbian Exchange because there is both a clearly defined temporal point of contact and biogeographical boundary from which to work. However, proper identification and interpretation of this visual evidence depends equally on artistic and scientific expertise. It is therefore important to consider how art history and natural history scholarship can best be integrated to provide the most informed reading of such images. This paper focuses on depictions of imported American animals in European art from the early contact period of the 16th century, examining them through combined art historical and zoological lenses. As all such works appear to predate their first published scientific descriptions by decades, the importance of looking beyond the published record for zoological and biogeographical data is also highlighted.

Historiographical Conflicts in Mexico: Darwinism, Biology and Imperialism in the Practice of Science ***Juan Manuel Rodriguez Caso, Universidad Nacional Autónoma de México***

The history of evolutionary theory tends to focus on analysing its development and impact in specific countries such as the United States, Britain, France and Germany. Given the centrality given to evolution, the history of biology has, in turn, focused on a reconstruction around it. In recent years, one can speak of a conflict between how biologists have firmly pushed the history of biology, with presentism as an approach often used, especially to defend the logic of the "Darwinian revolution" itself. In the so-called "Global South", there are traditions that analyse the introduction of Darwin's ideas into diverse cultural contexts, with the starting point being a continued reassertion of diffusionism. This presentation is a reflection on the impact of diffusionism and presentism in the specific case of the history of science in Mexico. Part of the argument will focus on contrasting the approaches of biologists and historians to the history of biology. On the other hand, the consequences of the "Darwinian Revolution" on the conception of biology in Mexico will be discussed. In addition, within the context of recognising scientific imperialism, the need for a deconstruction of scientific ideas will be raised, contributing to the genuine recognition of local histories in the global context.

Evolutionary Conception of Sanitary Work: Racialist Discourse Inside Arnoldo Gabaldón's "Una Política Sanitaria," Venezuela, 1930-60. ***Piergianna Mazzocca, Cornell University***

While visiting the hamlets that seemed to emerge from the rural landscape, a group of men from the Malaria Division of Venezuela became concerned about the unhealthy conditions of the houses they surveyed. The "rancho"—a common dwelling—was, for these experts, particularly troubling. Made up of thatch roofs, rammed mud walls, and compacted earth floors, the rancho was a site of both social and physical corruption. The proposed solution was to eliminate such dwellings, bringing not only a change in health status but also a change in people's way of living. By replacing the rancho with a modern dwelling made up of cement blocks and concrete slabs, the experts suggested, the rural man could be saved from his diseased environment but, more significantly, from himself. Enunciated by doctors, not architects, these architectural recommendations and demonstrations of sanitary expertise became a staple of a meliorist approach to both the environment and bodies that malaria eradication campaigns in the Americas promoted between the 1930s to the 1960s. This paper traces the entanglement between architecture, landscape, and medicine, attending to the role that sanitary experts

played in transforming medical knowledge into a spatial practice. Architecture, in this story, was the technology that the medical and sanitary technocrats used to incorporate agrarian regions and their people into activities tied to resource extraction. The paper asks: How was it possible to equate the amelioration of the environment with the betterment of bodies necessary to carry out the works of modernization? And what social, spatial, and racial meanings did sanitation work carry? By looking at Venezuela's eradication campaign, this paper writes the history of a Venezuelan technical elite into larger histories of medical and racial formations that help reframe a history of the built environment that was increasingly shaped by these experts' approach to sanitation.

Chair:

Anne Ricculli, Morris Museum

MONDAY, OCTOBER, 14

002. Entangled Modernity: Science and Architecture in the Islamic World

Organized Session

12:00 to 1:30 pm

Virtual Session: Virtual Room 1

The advent of modernity is often viewed as a rupture in the production and conditions of knowledge, a break from the past by scientific or political revolutions. Such a view of modernity makes it difficult to understand the hold of the past in the present, on the one hand, and why certain ideas and techniques proved so longstanding, on the other. Against a narrative of a sharp break between old and new, this panel illuminates the entangled relationship and self-conscious negotiation across imperfect pasts and uncertain futures, through four case studies from 19th and 20th-century Egypt and the Ottoman Empire. The first paper looks at the rather surprising circulation of an Aristotelian-Avicennian account of natural philosophy in nineteenth century Ottoman Empire during a rapid process of modernization. By looking at the reception of the translation, the paper asserts that, rather than opposing the new, this older approach to natural philosophy may have buttressed the modern interest in natural sciences. The second paper looks at two leading nineteenth-century Muslim scholars' engagement with modern science and empire, arguing that they made use of their familiarity with the patrimony of Islamic scientific knowledge to appreciate modern European science, and also challenge its political neutrality. The third paper investigates the interplay between knowledge production and tool making in the early modern Ottoman architecture, again paying attention to both continuity and change in that period, moving the discussion's focus from theory into practice. The final paper explores the boundaries of 'modern architectural knowledge' and its relationship to the science of building in the Egyptian context. It challenges the prevailing idea that modernity solely emerged in the nineteenth century through knowledge transfer and advocates instead for a narrative of transformation. Taken together, all four case studies reconnect the long history of Islamicate sciences with modern knowledge production and knowledge deployment.

Participants:

Late Ottoman Interest in the Modern Science and Circulation of Akkirmânî's Translation of Abharī's Hidāyat al-Hikma and Its Commentary by Maybūdī *Kenan Tekin, Boğaziçi University*

In mid-eighteenth century an Ottoman judge and scholar, Mehmed Akkirmānī (d. 1760), translated Hidāyat al-Hikma of Athīr al-Dīn al-Abharī (d. ca. 1265), together with one of its commentaries by Qādī Mīr Maybūdī (d. 1504) into Ottoman Turkish. It was a handbook of Aristotelian-Avicennan natural and metaphysical philosophy. This fact, though an important contribution to Turkish literature, is not as surprising since Ottoman scholars had been translating scientific and philosophical works into Turkish for a few centuries by that time. What is of interest to us here is that this translation seems to have had a remarkable reception in the late Ottoman Empire (i.e. the long nineteenth century) considering that a few dozens of manuscript copies of the work survived from the period. Furthermore, it was published a few times in the late nineteenth century. In this paper, I will first introduce the work and then analyze information about the copies of the translation such as their ownership, endowment information, scribes etc. Based on such information I would like to show if there was any relation between circulation of this manuscript and emergence of late Ottoman interest in the modern science.

Islamicate Patrimony and European Imperialism: Sovereignty, Justice, and Classifications of Knowledge in al-Jabarti (d. 1825) and al-Afghani (d. 1897) *Jane H Murphy, Colorado College*

The writings of 'Abd al-Rahman al-Jabarti (d. 1825) and Jamal al-Din al-Afghani (d. 1897) explicitly engaged French and British imperial invasions, while also devoting significant

attention to questions of the production and classification of 'scientific' knowledge. This paper examines those intersections, arguing that conceptions of intellectual patrimony and the classification of scientific knowledge were central elements of both men's analyses of history, power and, ultimately, justice. This paper revisits frameworks of "appropriation" and "naturalization" developed in regard to early and medieval Islamic societies, alongside the seminal analysis of 'Abbasid translation and empire (Sabra 1997; Gutas 1998), arguing that al-Jabarti and al-Afghani both already understood questions of sovereignty and knowledge production to be deeply intertwined, a fact that the modern historiography of science has come to appreciate much more recently, and each in his own way deployed Islamicate scientific patrimony to negotiate modern questions of power.

Transformations in Practical Mathematics and Measurements in Ottoman Architecture ***Gul Kale, Carleton University***

This presentation will explore the transformations of the architect's tools, measurements, and practical mathematics in the early modern Ottoman world. It argues that the changes in architectural and technological contexts also transformed representational, surveying, and building practices. Tools and units were active agents in building and renovating civic architecture in the growing cities. Despite their social and cultural importance, the history of tools and units, such as cubit, aerial balance, plane table, surveyor's compass, and meter, have not been examined critically by considering the alterations as well as the continuities in their uses. I will look at some museum collections and books on mathematics to discuss how they impacted architectural thinking and making, or theory and practice.

From Ali Mubarak to Sayed Karim: Exploring the Boundaries of Architecture and the Science of Building in Modern Egypt ***Shaikhah Alsahli, Kuwait University***

This research explores the changing boundaries of the architecture discipline and its relationship to other fields of knowledge — mainly science, mathematics, and art — in modern Egypt, with a specific focus on the work of two Western-trained individuals: Ali Mubarak (1823-1893) and Sayed Karim (1911-2005). In this study, I explore the definition of "modern architectural knowledge" and argue that architectural modernity in Egypt did not emerge from an intellectual void. Instead, I emphasize that Egyptian architects, engineers, and intellectuals of the nineteenth and twentieth centuries sought to integrate this modern knowledge into their own context. In support of this position, this study closely examines Mubarak's ideas on the modern science of building and Karim's conception of architecture as a scientific art.

Session Organizer:
Jane H. Murphy, Colorado College

Chair:
Jane H. Murphy, Colorado College

MONDAY, OCTOBER, 21

003. Technoscience in the Global South

Contributed Paper Session
12:00 to 1:30 pm
Virtual Session: Virtual Room 1

Participants:

Experimenting with Cainca: Brazil's Plants, Hybrid Knowledge and German Technoscientific Culture, 1820-1850 ***David Labastida Rodriguez, University of Toronto***

In the 1820s, the German scientist Heinrich Langsdorff led an expedition in Brazil to collect botanical materials for Russia. Among his collections, Langsdorff shipped seeds and barks of the plant cainca. In addition to Russia, the German territories also benefited from his material. Langsdorff cataloged cainca as a promising medicinal drug to alleviate dropsy and dysentery. While Langsdorff collected this plant, indigenous people used cainca for healing snake bites. As this plant arrived in Germany, local apothecaries began to experiment chemically with its bark to produce purgative decoctions. This paper interrogates the epistemological transition of cainca from its status as a herbal medicine to its pharmacological commodification between 1820 and 1850 I argue that Langsdorff developed a technoscientific conception of cainca as a chemically modifiable plant for the industrial production of purgative decoctions. This discourse was based on medical knowledge generated through treatments of local Brazilians, indigenous groups, and enslaved people. By experimenting with cainca in a milieu of imperial exploitation, Langsdorff replicated a German technoscientific culture that produced pharmacological knowledge

based on practicing with humans and for practical industrial usage. However, I argue that the medicinal conceptions of indigenous groups about cainca were essential for Langsdorff's development of cainca-based methods. This preliminary experimentation in Brazil laid the foundation for further chemical experimentation in German apothecaries that acknowledged and reworked the hybrid knowledge produced in Brazil. The nascent pharmaceutical industry in Germany, therefore, succeeded in chemically manipulating the healing properties of cainca, reinforcing a German technoscientific culture.

The Ordering of Landscape: The Case of Kanan Devan Hills Produce Company and Munnar ***Amil Varghese, Research Scholar***

The genesis of tea cultivation in India can be traced to the colonial period. During the Company rule, the colonial state under Governor-General William Bentinck set up a tea committee in 1834 to look at the prospects of undertaking tea cultivation in British India. The committee recommended cultivating tea in North East India, Nilgiris, and the Western Ghats in southern India. Unlike Assam and the Nilgiris, the large-scale tea cultivation in the Western Ghats, especially in present-day Munnar, Kerala, kickstarted when the Kanan Devan Hills Produce Company (KDHP)acquired large swathes of land during the closing decades of the nineteenth century. The land acquired by the KDHP Company consisted mainly of virgin forests, and the Company undertook large-scale clearing of forests to set up tea cultivation, thereby transforming the untamed virgin forests into an "orderly landscape". The plantations were located far from the centres of power, in the peripheries, and the mere presence of the state in the region emboldened the planters to become the de facto rulers of the region. The cultivation and production of tea were accompanied by infrastructural development in the region, which was mainly introduced to find markets for processed tea. The paper will critically examine, through the lens of "techno-ecological imperialism", the role played by the KDHP Company and explore the nexus between the Company management and the erstwhile princely state of Travancore -under whose territorial jurisdiction Munnar came- in introducing changes in the landscape of the region during the first half of the 1900s.

Bugs on the Great Wall: Computer Viruses, Artificial Life, and Cybersecurity During the Cold War ***Luqing Zhou***

Why do we imagine machines as objects capable of being infected by and spreading "viruses"? How does this imagination in turn shape our conceptions of information infrastructure? The most direct response is to examine those infected machines themselves. This paper focuses on the history of computer viruses, situating their emergence, evolution, and dissemination within the context of the Cold War. The discussion is structured into three sections: (1) Analyzing the early scientific conceptualization of computer viruses, where in the nascent stage of computer theory, "viruses" were equated with "self-reproducing programs," demonstrating a notion of artificial life entirely different from confrontation and threat. (2) Using three instantiated computer viruses—"AIDS," "I love you," and "Y2K bugs"—as case studies, describing how computer viruses transformed into risks of the Cold War and the information society after the 1980s. (3) Examining China's reception of and response to two kinds of computer virus ideas, highlighting it as a knowledge transfer process that transcended Cold War barriers. This paper argues that in dealing with computer viruses, China has shifted away from the ideas of artificial life and "self-producing", while adopting the ideas of cybersecurity and information risk. This "epistemological break" explains how in the Cold War edges penetrated by media, both networks and iron curtains, connections and risks, trust and panic coexist. Through this analysis, I aim to explore the techno-politics involved in constructing cybersecurity systems in the Third World, and how these developmentalist technical practices, in turn, reshape national boundaries within the global internet infrastructure.

The Localization of Modern Beekeeping Practice and Disease Control: A Multispecies History of Chinese Apiculture ***Haixing Wang***

At the end of the 19th century and the dawn of the 20th century, the introduction of Western scientific beekeeping methods, characterized by the utilization of movable-frame beehives, along with the importation of Italian bees (Apis mellifera L.), opening the prelude to modern apiculture in China. In the traditional narrative of history of science, we discuss the roles played by different actors such as beekeepers, social elites, beekeeping associations, local and central governments, and the obstacles encountered in the process of constructing and

promoting modern scientific beekeeping knowledge networks. One of them is the frequent occurrence of bee colony diseases. However, the localization of Western beekeeping practice in China is not only the construction and transfer of knowledge and technology, nor does it operate in a vacuum. It also reflects an interface of interaction between humans, bees, and the environment in specific time and space. Based on my interest in multispecies history and non-anthropocentrism in writing, I attempted to embed the interaction between humans and bees into the broader and more complex ecological and social networks of twentieth-century China. By analyzing the connections between migratory beekeeping, colony diseases, veterinary treatment, and their environmental impacts, I show how bees and their microbial disease and vermin have led to a renewed view of the history of Chinese apiculture, and how a range of scientific activities and quarantine regimes revolved around bees in twentieth-century China.

Chair:

Brittany Shields, University of Pennsylvania

MONDAY, OCTOBER, 28

004. Integrating History and Philosophy of Science in Latin America

Organized Session

12:00 to 1:30 pm

Virtual Session: Virtual Room 1

Philosophers of science recognize the importance of social location when theorizing the claims of the natural sciences. For example, feminist philosophers of science have demonstrated the relevance of context by situating knowledge practices. This Organized Session will explore the situatedness of science by focusing on geographical situatedness, which remains undertheorized. More specifically, it will focus on how scientific and political practices in Latin America both challenge and help us develop methodologies relevant to historians and philosophers of science. In this sense, the talks will integrate the philosophy of science and history of science as well as decolonial studies and social studies of science in Latin America to address the following questions: (1) What does it mean to do geographically situated philosophy of science? (2) What roles have values played for past and present scientific practitioners in Latin America? (3) How have activists and social movements in the region theorized the role played by the sciences in their own colonial domination? And relatedly, what is the role of the sciences in struggles for emancipation? Lastly, (4) how do these perspectives help us rethink the role played by the sciences today related to extractivism and ecology?

Participants:

Decolonizing Scientific Practice *Linda Alcoff, Hunter College*

Decolonizing the sciences requires replacing extractivist epistemic practices with collaborative ones. In this paper I will explain how in the modern colonial era, extractivism, broadly understood, has had an impact on knowing practices in general, including practices of justification and ontologies of truth. Decontextualized knowledge that downplays the role of interpretation renders collaboration unnecessary. Interpretive practices require thick cultural understandings that may be inaccessible to outsiders. Today there are many attempts to develop more truly egalitarian collaborations in the sciences (both natural and social); these hold lessons for the decolonization of knowledge and the development of a dialogic approach to epistemology. In this paper I want to draw out some of these normative lessons by drawing on case studies in the areas of museum studies and ethnobotany. I will begin with some recent work by Briana Toole in which she takes up the work of Kristie Dotson and Peter Railton to develop the concept of an epistemological system. This provides a way to portray the epistemic obstacles and blocks that conceal the operations of power in knowing. I will then use the case-studies to draw out corrective epistemic practices.

The Concept of Extractivism *Pedro Monque, CUNY Graduate Center*

The concept of extractivism has gained widespread popularity throughout the world to criticize the social and ecological harms of natural resource extraction. Perhaps no other Latin American environmental concept has had as much global resonance and uptake. And yet, it is no easy task to define just what extractivism is. Is it a type of activity, basically co-extensive with the “primary” sector (or the more specific “extractive” sector) discussed by economists and development banks? Is it a problematic configuration of the economy focused on the export of natural resources, as Latin American dependency theory criticized in the 1960s and 70s? Or is it something more abstract, like a “mode of capitalist accumulation,” a “mode of territorialization,” or

an ideology of human supremacy that instrumentalizes non-human nature? All of these senses of extractivism are currently at play in the social sciences and in the politics of environmental social movements. But are they broadly compatible with each other? And, if they are not, what do we learn from the multiple uses of the concept of extractivism? In this talk, I examine the different uses of extractivism to clarify the distinct objects of concern targeted by particular users of the concept. I argue that, in the first place, it is important to recognize that "natural resource extraction" is a term that already presents interesting conceptual challenges. "Natural resources" are not natural kinds but intentional ones, as Avery Kolers and others have argued, and this already introduces a normative element into the transformation of nature into "natural resource." Extraction, too, can be difficult to apprehend. Though there are uncontroversial cases like mining and oil drilling, involving a static resource of fixed stock, there are other forms of extraction of "resources" that flow (like water) and are not fixed in number (like trees or fish). Thus, a critique of natural resource extraction, such as is embodied in the concept of extractivism, must have a principled way of distinguishing between ordinary flows of energy or matter, and instances of extraction that could qualify as extractivism. After examining the idea of natural resource extraction, I explain the different objects of concern proposed by different definitions of extractivism. These include: the renewability versus non-renewability of the extracted resource, the sustainability of the extractive practice, the violence (toward humans and/or non-humans) of massive extraction, an instrumental versus a reciprocal orientation toward nature, and the economic dependence engendered by extractive economies. As I will argue, not all of these framings of extractivism are compatible with each other. However, it is not clear that this means the concept is broken. Rather, we can take anti-extractivist critique to reveal a variety of scales at which resource extraction can be criticized: from the very notion of a "natural resource," to particularly harmful practices like gold mining, to the broader structural effects of extraction on economies (the resource curse) and culture (the domination of nature). I conclude by discussing different ways we might work with the concept of extractivism.

Philosophy of Global Science: A View From Latin America ***Juliana Gutiérrez Valderrrama, Universidad de los Andes***

The abandonment of the value-free ideal of science implies a new normative challenge: we need mechanisms to manage and justify the presence of values and criteria to identify which values are to be allowed in science and what their legitimate roles are. Philosophers have developed different frameworks for facing these questions, and most pose social and epistemic diversity as central to science's objectivity and social responsibility. In my presentation, I stress the need to broaden the scope of diversity. From the perspective of a "peripheral" location (such as Latin America), geographic diversity becomes a relevant dimension. On the one hand, global science mainly serves the values of the most privileged locations at the expense of the needs of the most vulnerable regions (Fernández Pinto, 2019). On the other hand, "peripheral" scientific communities suffer epistemic injustices, are subject to a hierarchical division of cognitive labor, and face economic, social, and institutional access obstacles to platforms, networks, and knowledge (Feld & Kreimer, 2020). However, current philosophical frameworks still need to be improved to consider this dimension. First, given the mainstream focus on demographic diversity (race, gender, class, etc.), most frameworks provide tools for increasing participants' diversity in abstract and leveled (inter)institutional contexts with no mention of their location (Longino, 2002). This depicts a non-situated science isolated from the geopolitical order. Second, when there is mention of the importance of addressing geographical diversity in relation to global (and colonial) inequalities, the discussion revolves around two issues: (i) the integration and dialog between so-called "Western" science and "non-Western" knowledges produced in subaltern locations (Harding, 2015); or (ii) the promotion and development of the latter (e.g., Castro-Gómez & Grosfoguel, 2007). Though laudable, these strategies can result in a case of testimonial injustice produced by prejudicial credibility excess (Davis, 2016). More specifically, mainly expecting and promoting (radically) different contributions from the epistemic communities in subaltern locations –i.e., "non-Western" perspectives– truncates their epistemic agency and limits their participation in the production of global scientific knowledge. Therefore, current

value-laden ideals remain limited in guiding the collaboration and engagement among scientific communities in diverse geographical locations, which is necessary for facing global concerns. I conclude by suggesting a way forward to develop more inclusive normative frameworks for global value-laden science.

Technocratic Domination under Regimes of Expertise: The Case of Economics in Latin America ***Rory Dean Kent, University of Cambridge***

In this talk, I use the case of economic expertise in Latin America to demonstrate that philosophy of science can contribute to the critique of structural domination, and thus fold its insights into contemporary currents in political philosophy. While sociologists and historians of science (and indeed Latin American decolonial theorists) have long attended to the role of science in the constitution of dominant social-political arrangements, few philosophers of science have made this a major theoretical concern. However, philosophy of science has conceptual resources that are useful for clarifying processes by which science and expertise are embroiled in political domination. In particular, philosophers of science are well-placed to criticise dominant ideologies of science, so far as they can explain how such ideologies distort the nature of science and thereby mystify the scope of scientific expertise. The case of economic expertise in Latin America is especially useful for developing this critical role for the philosophy of science, so far as the role of relevant ideologies of science are well-exposed, and the interests associated with the regimes of expertise are particularly salient. Thus, I also demonstrate a metaphilosophical point, by showing that a geographically local case-study can contribute to the development of a critical philosophy of science. The programme of this talk is as follows. First, I briefly introduce the relevant theoretical background on structural domination and ideological mystification. Then, I explain the concept of technocratic domination as a variety of structural domination. By my account, the relevant structures that reproduce technocratic domination are certain regimes of scientific expertise, through which the political freedom of 'laypersons' is systematically constrained. Next, I describe the case of economic expertise in Latin America, focusing especially on the development of neoclassical economics (and, relatedly, neoliberal governance) in Chile. I explain how the regime of expertise emerged and structured the technocratic domination of laypersons, in part through ideological mystification of the nature of science. Finally, and by way of concluding remarks, I suggest a forward programme for a political philosophy of science that uses geographically local case-studies to build a realist picture of the relations between science and politics, in contrast to work that focuses more abstractly on 'science and values'.

Session Organizers:

Alejo Stark, University of Utah
Francisco Calderón, University of Michigan, Ann Arbor

Chairs:

Alejo Stark, University of Utah
Francisco Calderón, University of Michigan, Ann Arbor

THURSDAY, NOVEMBER, 7

005. HSS Executive Committee Meeting
Business Meeting
9:00 to 12:00 pm, Thursday 7 Nov.
Fiesta Americana: Lobby Level - Sala de Consejo
Chair:
Evelynn Hammonds, Harvard University
Participants:
Soraya de Chadarevian, University of California, Los Angeles
Matthew Shindell, Smithsonian National Air and Space Museum
Gwen Kay, SUNY Oswego
Alisha Rankin, Tufts University
Elise K Burton, University of Toronto
Projit Bihari Mukharji, Ashoka University
Emily Hamilton, University of Massachusetts, Amherst
John Paul Gutierrez, History of Science Society

006. Registration Day 1
9:00 to 6:00 pm, Thursday 7 Nov.
Fiesta Americana: Yucatan Foyer Registration Desk

007. Forging National Identities
Contributed Paper Session
12:00 to 1:30 pm, Thursday 7 Nov.
Fiesta Americana: 1st Floor - Izamal I
Participants:

Technoprospecting Persia; How Global Academic Surveys of Small Technologies Forged the Iranian Identity (1925-1941) ***Ata Heshmati, University of Toronto***

This project will examine how two specific surveys of arts, crafts, and small technologies of Iran, which were funded by the monarch of Iran in 1925-1941 contributed to the formation of a modern Iranian national identity. The first survey was conducted from 1926 to 1938 by the American art historian, Arthur Pope and his student, Phyllis Ackerman, in collaboration with a team of Euro-American historians and archeologists. The second survey was conducted with a narrower technological focus in 1938-1941 by a German engineer, Hans Eberhard Wulff. Inspired by studies of biological surveys for medicinal herbs which have been labelled as “bioprospecting”, I call this type of exploration “technoprospecting” surveys; the state- or foreign-funded search for local technologies of the indigenous or admixed communities with various ideological, industrial, commercial, or technoscientific purposes. These surveys were only two Western examples of semi-colonial and transnational models for identifying technologies and technical expertise in the Global South. Later in the 1960s, Wulff continued his technoprospecting surveys of Iran and expanded it to Pakistan under a larger UNESCO-funded program for salvaging traditional techniques in third-world countries. Two other groups of Japanese geographers, mostly from the University of Kyoto, also managed to do vast technoprospecting surveys in the 1960s in Southwestern Asia. Albeit through different methodologies, these surveys presented the multiplicity and heterogeneity of arts and technologies of various regions of Iran as a homogenous and continuous identity. Hence, they invented categories such as “Persian arts and crafts” which entailed some specific racial theories about the superiority of the Aryan race in the Middle East region. Consequently, many Iranian intellectuals and statesmen in the 1930s began identifying traditional technologies of Iran as the primary roots of Western technologies and demanded recognition, preservation, and restoration of these technologies as both national and global heritage of the history of technology.

Technologies of Individuation: Making Individual Identity in Postcolonial Pakistan ***Zehra Hashmi, University of Pennsylvania***

The process of decolonization in South Asia not only ushered in new political forms—the nation-states of India and Pakistan, territorialized and partitioned along majoritarian logics in 1947—but also new technologies of rule. This paper will demonstrate how the process of decolonization, and specifically of partitioning colonial India into independent India and Pakistan, produced new governmental technologies for identifying unique individuals. In particular, through a focus on the Indian subcontinent’s second split in 1971—when East Pakistan became Bangladesh after a civil war—this paper will show how securitized anxieties shifted focus from technologies directed at identifying an “other” to establishing and tracking the identity of those within. This paper traces how political shifts during this period—in the wake of an escalating Cold War in the region—shaped bureaucratic approaches to information, ultimately culminating in a national identity database. Through this, I examine the relationship between polyvalent identity and the individual, and how this relationship was reconfigured through the new technologies of

identification. In turn, this paper reflects on the entanglement between power and technology, as it becomes visible in technologies of governance developed by the postcolonial state. In so doing, it aims to build insights into increasingly ubiquitous identification technologies across the global South, their new informational forms, and the long political histories they are constituted within.

America Adrift: Floating Nuclear Power Plants and the Decline of American Power *Warren J. Dennis*

In the early 1970s, American energy consumption increased while an expanded regulatory state and the environmental movement stymied the construction of new power plants. To meet rising demand, PSE&G in New Jersey developed a novel solution to this problem: nuclear plants based on the ocean. Westinghouse Electric partnered with Tenneco to build these massive creations while employing a small army of scientists to adhere to new environmental guidelines. At a time when American energy security seemed in doubt and the Nixon and Ford administrations sought a return to energy 'independence,' floating nuclear power plants seemed like a commonsense solution to the energy shortage that could both provide substantial domestic energy and deal with activists' critiques regarding health and safety. This paper examines how political and corporate leaders sought to use patriotism and the environmental zeitgeist of the day to lend support to this venture, ultimately failing in their effort because of a combined, if often bifurcated, campaign waged by environmental groups and New Jersey economic interests. This work adds to a growing scholarship that challenges assumptions about the political shift in the 1970s, finding areas of commonality between conservative and liberal groups in the energy space. As the world considers non-carbon-based energy sources, this paper offers insight into the potential pitfalls of one such a project.

Conceiving "Chinese Speed": Contested Sociotechnical Imaginaries of High-Speed Rail in Post-1978 China *Zhongxian Xiao, Georgia Institute of Technology*

This article scrutinizes the changing sociotechnical meaning(s) of "speed" and High-Speed Rail (HSR) to different Chinese actors in post-Maoist China. Since the introduction of HSR in the 2000s, speed has been enshrined in Chinese nationhood. The Chinese government, technocrats, and experts disseminated a rosy image of Chinese Speed through domestic and international mass media. Despite the very nature of technocracy, the sociotechnical meaning of Chinese Speed has never been uncontested. The technocrats of Ministry of Railway conceived the acceleration of train speed as a techno-fix to the problems that public transportation and national economy faced in the 1980s-1990s. The social and technological critique of high speed in the twenty-first century demonstrated a growing public distrust of China's technocratic order. This wave of critique reached a climax in the Wenzhou train collision incident on July 23, 2011. After this incident, Chinese technocrats did not intend to reform the technocratic system. Instead, they turned away from a progressive mentality of speed to the techno-risk regulation and techno-economic rationales, which allegedly built upon higher speed capacity, improving operational stability, and more sophisticated economic calculation of HSR. Drawing on the scholarship in Science and Technology Studies and the history of technocracy in modern and contemporary China, this article argues that the popular image of Chinese Speed has become a site of shifting sociotechnical imaginaries where technocrats and engineers reconstructed the power fabric of Chinese infrastructure building under the influence of social critics.

Chair:

Luis Felipe Eguiarte Souza, Pavek Museum

008. Scientific Cooperation between Global North and South

Contributed Paper Session

12:00 to 1:30 pm, Thursday 7 Nov.

Fiesta Americana: 1st Floor - Izamal II

Participants:

National Ideas, Transnational Projects. The Emergence of Cacao Science in Colombia, 1930s-1950s *Edna Carolina Bonilla*

In this paper, I describe how the science of cacao was developed in Colombia from the 1930s to the 1950s. Based on analyzing scientific, informative, and governmental documents on cacao in the Colombian agricultural context, I examine scientific expeditions, agronomic development plans, cacao programs, and local institutions. This study reveals that cacao science in Colombia was not born alone; it involved producing a transnational network of knowledge among

local institutions in Colombia, Trinidad, and Costa Rica, immersed in a global agenda interested in increasing cacao production. Furthermore, in the processes of production and circulation of scientific knowledge, the biodiversity of cacao emerged as an epistemic axis, which means that cacao biodiversity became a scientific problem subject of discussions between experts and States as a result of the relations between natural knowledge and socio-political orders. The historiographic contribution of this work has several aspects. First, it concerns the origins of agricultural modernization in Latin America; these origins are more complex than other studies have recognized, in which transnational collaborations, mainly of British imperial science with domestic agricultural development programs, are inescapable. Second, it traces the origins of an ecological preoccupation with cacao and its landscapes, where experts discussed ways to care for the environment and the livelihoods of the producing families. It also shows the importance of cacao research for the professionalization of agronomists in Colombia. Finally, it provides an understanding of the problems of the cacao industry and the context-dependent human values involved in decisions about what to produce.

Technoscience and International Cooperation in the Face of Nutrition Problems in Latin America, 1950-1970 - (Presentado en español)
Juan Carlos Góngora, Instituto Venezolano de Investigaciones Científicas

At the end of World War II, the Latin American region was faced with a new geopolitical and social panorama within nations. In this context of changes, international cooperation emerged as a fundamental strategy for the construction of a new order in international relations, where technoscientific knowledge becames a relevant factor for the development of the modernizing project and the approach to the main problems of society, as exemplified in the case of the consolidation of the biomedical field and its impact on public health and nutrition. In this context, the work suggests that cooperation in the technoscientific field played a prominent role in terms of the development of applied nutrition as a strategy to manage the problems related to deficiency diseases, caused by micronutrient deficiencies, which affected the child population to a greater extent. In this way, it is shown, through various examples, how different programs were created and implemented, mainly from international cooperation to address these problems, as shown by the nutrition schools at the university level and the research centers that emerged in this period. In the methodological aspect, the historical-critical approach and the study of the documentary sources of international organizations constitute the central elements to approach the issue from an overall vision in the Latin American context.

Cooperation, Control, and Resistance: The Foundations of the First Scientific and Technical Documentation Center in Latin America (1950-1962) (Presentado en español)
Adriana Minor, Centro de Estudios Históricos, El Colegio de México; Yuirubán Hernández-Socha

In 1950, the Mexican government and UNESCO agreed to create the Centro de Documentación Científica y Técnica de México (CDCTM; scientific and technical documentation center of Mexico). Under the scope of UNESCO's technical assistance program, a study was prepared about the situation of the library collections of periodical scientific publications existing in Mexico's capital. The relevance of creating such a center -the first in Latin America- became evident. Its promoters recognized 'the waste' involved in the lack of information about science produced in Latin America. They also pinpointed the problem derived from the fact that the main bibliographic publications were in English, making them inaccessible to the vast majority of Latin American scientists. In that sense, the CDCTM would counteract the exclusion of the Spanish language in the world of scientific publication, built around the basic principles of cataloguing: gathering, classifying, and distributing. In this presentation we will analyze the guidelines that promoted and made possible the emergence of this cataloguing project in Spanish, as well as the dynamics of its operation, based on the CDCTM bulletins and reports and UNESCO's archive. This case shows the ways in which scientific cataloguing converged with international scientific cooperation efforts, the anxiety to be part of the front of scientific development in the region, and the resistance to English as a lingua franca of science. In other words, cooperating, controlling, and resisting were the foundations that supported the existence of the first scientific and technical documentation center in Latin America.

Integrating 'Small Science'. North-South Relations in the Research Networks of Unesco's MAB Programme (1970s–1980s) ***Philipp Kuster, Ludwig-Maximilians-Universität München***

In spite of the global ambitions embodied in its name, the *Man and the Biosphere Programme* (MAB) mainly operated locally. The programme, launched in 1971 by Unesco to study human-environment relations, focused on coordinating many small scale research projects as well as a new type of protected area called 'biosphere reserve'. This 'small science' approach was presented as a strength of the MAB in comparison to previous environmental research programmes such as the International Biological Programme, as it enabled the research to be tailored to the local context. Decentralisation was also a necessity, because Unesco did not have the resources to finance the programme by itself and therefore relied on member states to fund projects in their own countries. However, the goal of regional and global synthesis remained with the MAB, leading to various efforts to bring the projects into exchange. This was done through the formation of cooperative networks in the late 1970s. This paper looks at one such network which linked MAB projects in arid and semi-arid lands, and highlights the methods and limitations of this attempt at synthesis. One important factor was the relationship between North and South: The network was designed around collaborations between institutions in the countries where the research took place with others in the Global North. Despite the rhetoric of bottom-up integration, global inequalities played a major role in the implementation.

Chair:

Adam Hill, Greenville University

009. Communicating Eugenics' Past, Curbing Its Future(s)

Organized Session

12:00 to 1:30 pm, Thursday 7 Nov.

Holiday Inn: Lobby Level - Maya

Historians have dispelled the myths that have animated popular imaginings of eugenics' past across varying geographies: The stories of Nazi eugenic exceptionalism, the universal benevolence of the welfare state, and reproductive "care" in occupied lands have all been debunked (Rembis 2018; Stepan 1991; Kline 2001; Broberg & Roll-Hansen 1996; Paul et al 2018; Johansen 1998). Despite these revelations, eugenics often gets relegated to an unfortunate, or "imperfect," past that nevertheless made way for a greater good in the present (e.g. the modernization of the welfare state). This narrative allows contemporary critics - in academia and beyond - to sever themselves from this past and from the responsibility of wrestling with it in the present. Today, eugenics still manifests in genetics, reproductive politics, health care, artificial intelligence, and the carceral system (Roberts 2009; Gebru 2023; Lira 2021). In a moment marked by compounding crises of climate, refugee and migration, health, and reproduction exacerbated by the COVID-19 pandemic, by the repeal of Roe v. Wade in the US, and by rising fascism, this panel asks how historians can best communicate eugenics' past to help curb its seemingly ever-evolving futures.

Participants:

Disability and the History of Eugenics ***Michael Rembis, University at Buffalo***

In a 2019 Washington Post article written in response to US Supreme Court Associate Justice Clarence Thomas's invocation of eugenics and its history in his concurring opinion in a case involving abortion laws in two states (Indiana and Kentucky), the reporter described eugenics as "the now-discredited pseudoscience obsessed with the genetic fitness of white Americans that was popular in the early 20th century."[1] While we cannot expect an online article published in a popular news source to engage with the vast and growing literature that has complicated our understanding of eugenics in the past and present, we can take this as a fair barometer of eugenics place in the popular imaginary – a discredited pseudoscience obsessed with breeding better white people. The implications of this description are clear: science and all but the most conservative ideologues have moved on from the dark days of the early 20th century eugenics movement. In keeping with the conference theme, "Imperfect Pasts, Tense Futures," I will engage with literature in disability studies and disability history to think about eugenics not as outdated, racist pseudoscience, but as an enduring ableist use of science to embody dominant notions of corporal fitness that have been at once historically contingent and shifting, and stubbornly persistent. Following the title of our panel, I will argue that historians of eugenics could better communicate its pasts and engage with its current and future iterations if they recognized its ableist roots. [1] Eli Rosenberg, "Clarence Thomas tried to link abortion to eugenics. Seven historians told The Post he's

wrong." Washington Post(May 30, 2019), Access April 5, 2024, https://www.washingtonpost.com/history/2019/05/31/clarence-thomas-tried-link-abortion-eugenics-seven-historians-told-post-hes-wrong/

"The Rich Get Richer and the Poor Get Children:" Eugenics, Genetics and Family Planning in the Post-WWII Period ***Natalie Lira, University of Illinois at Urbana-Champaign***

During the early to mid-twentieth century, eugenicists popularized the idea that heritable traits caused large-scale social issues like poverty and crime. As a result, individuals and groups believed to be carriers of these traits–namely low-income people, racialized groups, and people with disabilities–were targeted for eugenic policies like forced sterilization. Eugenic notions of strict heredity were discredited by the 1950s, and many geneticists actively distanced themselves from eugenic practices like forced sterilization. At the same time, geneticists developed new theories of genetic burden and biological fitness that continued to disparage marginalized communities. In this paper, I examine how genetic stigmatization and ideas around hereditary fitness continued to shape reproductive politics well beyond the period recognized as the height of the eugenics movement. This research delves into the history of federal family planning services established by President Lyndon Johnson as part of the administration's War of Poverty legislation. Specifically, I analyze data on surgical sterilization and contraceptive counseling (including oral and long-acting reversible contraception) in federally funded family planning clinics in several U.S. states and Puerto Rico between the late 1960s and into the 1970s. Empirical research on federal family planning programs by economists often tells a celebratory narrative of increased access to contraception and declining birth rates among low-income women. Yet, well-known lawsuits like Relf v. Weinberger (1973) and Madrigal v. Quilligan (1978) exposed sterilization abuse in federally funded programs. This paper situates these family planning programs within the historical context of population control efforts, which extended the eugenic logic of reproductive control as poverty prevention. I also examine how a resurgence of racist, ableist, and classist ideas about the genetic basis for intelligence, criminality, and poverty shaped the implementation of federal family planning programs. This research outlines the ways eugenics evolved in the context of family planning programs. Doing so can help us better identify and trace future evolutions of recalcitrant eugenic ideas of biological fitness that continue to impact the reproductive lives of marginalized populations today.

Making "Moral Mothers" and "Better Babies": Reckoning with Eugenics in the History of Reproduction in Denmark ***Victoria Pihl Sørensen, Cornell University***

The author of the blue-print for the Danish social reforms, and Social Democrat, Karl Kristian Steincke was an avowed eugenicist (Steincke 1920). When the party came to power in 1929, four eugenic bills were passed in the span of less than a decade (Koch 1996). That eugenics was widespread, embraced by progressives and feminists alike, is well-documented in the Danish as well as in the international eugenic historiography (Koch, 1996, Hansen 1996; Stepan 1991, Weßel 2018, Roberts 1998). In Denmark, feminists and women's organizations took part in this project as well, but their role in spreading eugenics has thus far been understudied and understated. Accordingly, this paper attends to the flow of eugenic ideology in the cultural work of women's, housewives', and motherhood organizations in the early twentieth century. I argue that their efforts to optimize child rearing, maintain "moral motherhood", and secure a place from which to speak in the public square were rooted especially in classism, ableism, and white supremacy. White Danish bourgeois women played a central role in defining what makes a "good mother" and who makes a "better baby," and the parameters for each of these standards were defined by eugenic ideology. Then, I interrogate the persistence of this eugenic maternal morality in Danish family planning projects launched in the aftermath of the Second World War. Finally, I suggest that historians could effectively demonstrate the endurance of eugenics by highlighting the link between this eugenic history and the standards by which the "good" nuclear family is measured today.

Session Organizer:
Victoria Pihl Sørensen, Cornell University
Chair:
Victoria Pihl Sørensen, Cornell University
Commentator:
Wendy Kline, Purdue University

010. Human and Animal Subjects

Contributed Paper Session

12:00 to 1:30 pm, Thursday 7 Nov.

Fiesta Americana: Lobby Level - Salon Celestun

Participants:

Approaching Zoo Animals Subjects of Historical and Scientific Research *Margaret Hanson*

Primates held in nineteenth-century American zoological gardens often had short, highly publicized lives. Touted as "missing links" and trained to eat with knives and forks, both the treatment and attention these animals received derived directly from contemporary interest in taxonomic science and the efforts to construct a complete hierarchy of animal life and to define the boundary separating human evolutionary perfection from nonhuman animals. This interest followed zoo primates in death, as their bodies were invariably dissected and used in studies of comparative anatomy. This paper is concerned with understanding these early zoo primates as scientific subjects: in considering how viewing chimpanzees, orangutans, and chimpanzees through the lenses of taxonomic and evolutionary science meant they were continually understood in relation to humans, shaping how zoos cared for and interpreted them in life, and how these understandings may have been reinforced by the scientific use of their bodies in death, for the study of comparative anatomy. At the same time, this paper also attempts to take nineteenth-century zoo primates seriously as historical subjects: to consider how intense anthropomorphizing both shaped their experience of life in the zoo. Ultimately, these discussions will consider how ideas about the human/animal boundary, the emphasis on primates' taxonomic proximity to humans and the consequent tendency to anthropomorphize them has served to obscure early zoo primates as both scientific and historical subjects.

The Faces of Desire: Of Monkeys, Men, and Morphine *Simon Torracinta, Harvard University*

Since the 1990s, addiction has increasingly been redefined by the neurosciences as a brain disease, a move which recasts earlier emphases on the will in neurochemical terms. On this account, substance abuse is a symptom of a fundamental disorder in the reward systems of the brain: addiction is, to quote one leading researcher, "dissociated wanting run amok." This paper examines the roots of such ideas in medical addiction research in the interwar period in the United States. While considerable historical attention has been devoted to the human research sponsored by the Public Health Service's Addiction Research Center, I argue that animal models in this time were arguably more influential in reshaping the biomedical paradigm of addiction in the long term. I focus in particular on the experiments of the psychologist Shirley Spragg at the Yale Laboratories for Primate Biology in the 1930s, which attempted to demonstrate a biological basis for conscious "desire" over and above purely physiological withdrawal. Spragg deliberately induced morphine dependence in a series of chimpanzees through forced injections, then put them through an elaborate set of psychological choice tests designed to isolate the role of "definite desire." This experimental test of desire, I argue, provides a stark contrast to the alleged hegemony of an anti-mentalist behaviorist framework in the psychological research on animals of this period. In this work, moreover, a capacity typically perceived as distinctively human was attributed to nonhumans through its biologization—which would be reapplied to human beings in later addiction models.

Honey Bee Colonization: Sociality and Evolutionary Hierarchy in 20th-Century Entomology *Leah Malamut, University of Minnesota*

European settlers carried a great deal of cultural and material baggage to the Americas, including their cultivated honey bees (Apis mellifera). However, bee culture was not new to the region: indigenous peoples in Mesoamerica have cultivated bees of the family Meliponini for thousands of years. These bees were just as culturally and economically important to them as A. mellifera was to Euro-Americans. In addition, ecosystems across the Americas include bees that do not produce honey, such as bumble bees, carpenter bees, and sweat bees. In the present day, these bees are less well understood than A. mellifera, which many human residents of the Americas do not even realize is an introduced species. This paper aims to answer the question of how A. mellifera came to dominate global bee knowledge. As interest in evolution and behavior grew during the late 19th and early 20th century, entomologists sought to explain the apparently selfless reproductive strategies of insects like ants, wasps, and of course, bees, coining the

category “sociality” to describe their behavior. I argue that sociality itself is a historically contingent concept that warrants further scrutiny. The case of A. mellifera shows that in choosing to center sociality, evolutionary science recapitulated imperialist ideas through the classification of non-human animals and created a taxonomy which favored the European honey bee as the most evolved bee in an evolutionary hierarchy. Other bees, particularly those native to the Americas, have been studied merely as evolutionary stepping stones toward A. mellifera’s status as the “most social” bee.

In Search of Natural Enemies: Living Collections and the Commonwealth Institute for Biological Control ***Lauren Killingsworth, Yale University***

This paper examines the material history of biological control in the twentieth century through the records of the Commonwealth Institute for Biological Control (CIBC) and its predecessors, the Imperial Parasite Service and the Entomological Research Committee of Tropical Africa. These organizations have a deep colonial history spanning over 100 years, in which they have shipped millions of living organisms across the globe in an attempt to control plant and animal diseases to make the tropics “hospitable for colonization.” Biological control gained traction in the twentieth century as a “naturalistic” alternative to chemical methods of pest control. The Commonwealth Institute for Biological Control organized global reconnaissance missions to collect live fungi and insect species that might be “helpful to man” in “combatting pests and disease.” How can we trace this collection and exchange of millions of organisms in both the historical archive and physical environment? I focus on entomologists’ efforts to procure “natural enemies” of the mosquito and tsetse fly. The CIBC experimented with organisms in the laboratory and in the wild, releasing microsporidia parasites in the South Pacific to destroy mosquitoes, and sterilizing tsetse flies in Tanganyika to control trypanosomiasis. They collaborated with international organizations including the WHO and International Atomic Energy Agency. This paper asks how we might recover the histories of ephemeral living collections, with an eye towards technologies of collecting, transportation, and propagation. How do we make sense of this deliberate extraction and exchange of living species in the name of health?

Chair:
Rachel Mason Dentinger, University of Utah

011. About Time

Contributed Paper Session
12:00 to 1:30 pm, Thursday 7 Nov.
Holiday Inn: Lobby Level - San Jacinto
Participants:

Mountain Time: Tense Futures and Present Pasts in the Alps and Vesuvius around 1800 ***Celia Abele, Boston College***

This paper examines how the Alps, Vesuvius, and other rocky formations functioned as markers of geological time in late 18th-century Europe. To do so, it looks at texts written by scientists, thinkers, or writers like Georg Lichtenberg, J.W. von Goethe, and François-René de Chateaubriand as well as engravings, notably from the various versions of the French Encyclopédie in circulation. These sources crystallize how such natural wonders excited awe and scientific curiosity while also inciting early tourism. They meant that a human point of view was included as part of nature, in line with the lack of clear distinction between human and natural history that is everywhere in scientific writing well into the 19th century. But they also laid the groundwork for focusing on individual human experience at the expense of nature or as part of a form of exploitative contemplation. Vesuvius and the Alps had the peculiarity of acting as physical touchstones for two different accounts of the sublime, each of which was linked to a different model of time: Vesuvius was violent, and its temporality eruptive and disruptive, whereas the Alps were silent, massive clues to the slowness of a geological time. Ironically, it was the latter, the Alps, which, in the end, disrupted temporal conceptions more. Above all, the sources this paper explores point to how the idea of geological time, an unfamiliar temporal framework that was often felt to be at odds with the more familiar quotidian experience of time, was altering the relationship between the human and nature.

Keeping Time With the Earth in 20th Century Mexico ***Lachlan Summers, Max Planck Institute for the History of Science***

Where most stories about the emergence of the international order of Greenwich Mean Time emphasize capital, in nineteenth-century Mexico, the nation’s business owners feared that entering global time would increase the

US' power over Mexican markets. Scientists, however, particularly seismologists, required a universal standard of time in order to triangulate the tremors of their territory with those around the world. At the turn of the 20th Century, Mexican seismologists were as involved in international efforts to institutionalise a universalised abstract time–such as the Greenwich Meridian Conference of 1884–as they were in the documentation and measurement of earthquakes. In these meetings, seismologists positioned Mexico within international time, then in their practical work, they brought this abstract time to Mexican territory. Mexico's participation in universal time arose, at least to some extent, from these efforts to keep time with the Earth. This required specific technologies like the telegraph–for calling the capital from distant registries to obtain the nation's time–but also seismographs that would maintain a 24-hour day that was not subject to "local time drift." By examining the practices and technologies Mexican seismologists used to ensure the accuracy of the time against which they plotted earthly movements, this paper illustrates how everyday scientific work turned universal time into a tool for domesticating the deep time of the Earth.

Nature's Proxies: A History of Studying Past and Future Climates ***Melissa Charenko, Michigan State University***

"Climate" defies easy definition. Anyone can observe or feel some aspects of the weather, but they can never experience the full temporal or spatial range that is climate. Many aspects of climate are beyond direct human experience. Climate must be mediated through computer models, instruments like thermometers, and organic and inorganic remains known as proxies that indirectly record the ebb and flow of climate over millions of years. With such varied ways to know climate, it is no wonder that scientific observers have advanced competing ideas about climate, many with some truth to them. My talk will focus on knowledge production by climate proxies such as fossil pollen, tree rings, and ice cores. In the twentieth century, scientists developed several techniques to infer past climate from many different proxies. I show how the different slices of time and space made visible with each proxy shaped notions of climate itself. I also examine how these varied interpretations of climate played an outsized role in explanations of human history and destiny. Scientists interested in climate over long timescales routinely discussed how climate influenced plants, animals, and, notably, people. By following the scientists who reconstructed climate using the natural archives, I show how material objects worked with scientists' perceptions of human groups to compel, constrain, and reinforce their understandings of climate, history, and the future.

Deep Time Labscapes: Natural Analogue Studies and the Experimentalization of Time ***Leander Basil Diener, Max Planck Institute for the History of Science/University of Zurich***

Time is probably the most important parameter in scientific research. Temporality is therefore also of great interest for the history of science, be it as the history of time standardization and time measurement, as the history of time perception or as the history of the acceleration or deceleration of processes in the laboratory. However, the historical literature on scientific temporality is mostly limited to human time periods as geological timescales are relegated to the realm of field studies, not of experimentation. This paper uses the example of nuclear waste and natural analogue studies in the 1970s to argue how imperfect pasts and uncertain futures are made available in the laboratory, not on a human but on a geological scale. The origins of the concept of 'natural analogue studies' is unclear, but it came in wider use in the context of research on nuclear waste repositories from the 1970s on. Because nuclear waste had half-lives of unimaginable dimensions, attempts to control such time scales needed either to invent tricks to accelerate natural processes (experimentalization) or to extrapolate from observable phenomena 'in real-time' (uniformitarianism). Nuclear waste scientists did both; they experimentalized geological time in the lab and they investigated current phenomena and extrapolated natural processes. The paper argues that natural analogue studies occupied an intermediate position; natural analogue studies were primarily field studies, but rhetorically they were repurposed as experimental systems with geological time dimensions.

Chair:

Karl Hall, Central European University

012. GECC Welcome Room Day 1

12:00 to 5:00 pm, Thursday 7 Nov.
Fiesta Americana: Lobby Level - Santa Lucia

013. As It Was: Ontological Approaches to Violence in Cold War Latin America

Organized Session

12:00 to 1:30 pm, Thursday 7 Nov.

Fiesta Americana: Lobby Level - Yucatan I

What was political violence during the Cold War and how was it known? This panel showcases scholarship that examines the knowledge practices and regimes that emerged from violent struggles and repressions in Latin America during the Cold War. Our panel seeks to denaturalize the category of violence by demonstrating that its reality is neither fixed nor one that precedes human inquiry. Instead, we approach violence from an ontological frame that examines how the reality of violence has been molded through the labor of human scientists working with human rights activists, legal scholars, and politicians, among others. These robust knowledge networks have become critical for excavating, quantifying, labeling, and remembering what violence was and, in some cases, how it might be dismantled or reconfigured. Presentations will focus on case studies from Argentina, Guatemala, México and Paraguay and will engage with the histories of various disciplines including psychoanalysis, forensic anthropology, public health, and genocide studies.

Participants:

“Pure Science”: Violence and Medical Research in the Guatemalan Spring *Lydia Crafts, Manhattan College*

In 2010, the United States apologized to Guatemala for a series of experiments on sexually transmitted infections (STIs) conducted in the country in the 1940s. U.S. and Guatemalan doctors working with the Pan American Sanitary Bureau intentionally infected 1,308 Guatemalans with three STIs—syphilis, gonorrhea, and chancroid. The doctors then tried to hide these experiments and keep them from the archival record. This paper will contextualize these experiments within the history of U.S. and Guatemalan diplomatic relations, the Guatemalan Spring (1944-1954), and in relationship to the medical pluralism of Guatemala. It will show that the experiments were never a secret; they were always known within U.S. and Guatemalan medical circles and among those who were subjected to experimentation. Drawing upon oral history interviews with U.S. and Guatemalan doctors, anthropologists, and survivors of medical experimentation, it will highlight that part of the reason that these experiments remained hidden is that U.S. and Latin American doctors naturalized Guatemala as a laboratory for U.S. research, and they also viewed Indigenous people as natural research subjects. The doctors further identified as the ‘best men’ who could determine the violence they deemed necessary to further scientific research. By focusing on the reactions that Guatemalans had to blood draws and the experience of the speculum as medical rape, it will also show that the harm caused by these experiments goes far beyond the bioethical framework that has been used to interpret this history of unethical research.

"The Case of Juliana: Psychoanalysis, Trauma, and the Future of Democracy in Argentina" *Marco A. Ramos, Yale University*

In May 1978, a ten-day old child was found in an office building in Buenos Aires. The child’s identity was a mystery. She had no papers, no name, no family, and no birthplace. Throughout the 1980s, various experts vied for the authority to define who she was. Scientists collected her blood, psychologists studied her mind, and politicians used the blank canvas of her identity to debate the democratic future of the Argentine nation. This essay discusses the contested identity of this child who came to be known as “Juliana.” Historical and anthropological studies have explored how human rights activists have used genetic science to identify the children of desaparecidos, like Juliana, in Latin America. However, less attention has been paid to the crucial role of the psy-sciences in these reparative justice efforts. Through the case of Juliana, I explore how psychoanalysis in Argentina was used to make and mold the reality of “intergenerational trauma” in the wake of disappearance. Working with the human rights organization, the Abuelas de Plaza de Mayo, activist psychoanalysts argued that the military’s “forced adoption” of children was an attempt to re-produce the Argentine youth—not biologically through sex—but rather socio-politically and psychologically through violence. For these activist analysts, the mental health of children, like Juliana, came to stand in, as a metonymy, for the psychological health of the nation and the potential for Argentina to recover from its traumatic authoritarian past to forge a democratic future.

Mutating Culture: Making and Molding Cold War Violence in Paraguay during the 1970s. *Sebastián Gil-Riaño, University of Pennsylvania*

In just two decades, Aché researchers made an abrupt turn. Instead of interpreting Western

culture as a civilizing force they came to view it as genocidal. For a cohort of French anthropologists with ties to UNESCO in the 1950s, captured Aché children served as striking examples of how early exposure to Western education and public health could liberate Indigenous youth from the trappings of backwardness and primitivism and induce lasting “cultural change”. Yet by the early 1970s, anthropologists, legal experts, political scientists, journalists and philosophers from Paraguay, German, Switzerland, the UK, and the US began to warn that the Aché – an Indigenous group from Paraguay who remained voluntarily isolated in the forest until the 1960s – were subject to genocidal extermination at the hands of an extractive Paraguayan dictatorship. To make this violence known, Aché researchers turned conceptions of culture on their head. Instead of "acculturation", experts described how the Paraguayan government had subjected the Aché to a process of “deculturation” or “ethnocide” where loss of culture destroys self-esteem and the will to live – a phenomenon that some called “psychic death”. What prompted human scientists to shift so abruptly in their interpretation of Western culture? Building on work by Marco Ramos and Ian Hacking, this paper argues that what was at stake in this shift is the historical ontological question of how experts “make and mold” the reality of violence during a period in which Cold War development projects became increasingly linked with genocide.

Death Count: How Genetic Databases and Registries of the Disappeared Produce Ontologies of Violence in Mexico ***Vivette Garcia-Deister, Universidad Nacional Autónoma de México***

There are 115,397 reported disappeared persons in Mexico’s National Registry and an estimated 54,000 unidentified bodies in Mexico’s forensic services. These numbers are enough to fill Mexico’s largest soccer stadium, the Estadio Azteca, 1.38 times with disappeared persons and 64% of its capacity with human remains. The construction of the Estadio Azteca coincided with the beginning of Mexico’s “dirty war” in the 1960s. The victims of disappearances from this period still haunt the National Registry, and every day more names are added to the ghosts of those who disappeared in the last century. This talk examines the Estadio Azteca as a metaphor for the production of old and new ontologies of violence in Mexico. Over the past decade, the creation of a National Registry of the disappeared and a forensic genetic database have been promoted as resources to address the humanitarian and forensic crisis. Instead, they are necropolitical devices for the administration of death.

Session Organizers:

Sebastián Gil-Riaño, University of Pennsylvania
Marco A. Ramos, Yale University

Chair:

Adam Warren, University of Washington

014. Green Ventures: Plant Knowledge, Colonial Science, and Imperial Demands in Latin America, Eighteenth and Nineteenth Centuries

Organized Session
12:00 to 1:30 pm, Thursday 7 Nov.
Fiesta Americana: Lobby Level - Yucatan II

This panel explores the intricate role of botanical sciences in Latin America during the colonial and postcolonial periods of the eighteenth and nineteenth centuries. It illustrates how practices of plant collection, naming, cultivation, and commodification transcended mere scientific pursuits, becoming deeply interwoven with the realms of power, culture, and economy. Through a series of diverse case studies — from revisiting Colombia's Mutisian archive and analyzing extractive practices by U.S. scientists in Cuba, to exploring guaraná's pivotal role in Brazilian state imperial strategies and the state-driven reforestation efforts in the Ecuadorian Andes —we examine the intricate interactions between indigenous knowledge systems and external imperialist demands. The panel aims to uncover the scientific and social repercussions of botanical extractivism. Part of our discussion is the critical yet often overlooked role of reproductive labor, emphasizing the contributions of indigenous and local communities, particularly women, for scientific and economic development. This focus illuminates the varied forms of botanical knowledge that have emerged or been obscured in the shadow of imperialism. By examining these dynamics, the panel seeks to underscore the continuous interplay of negotiation, resistance, and adaptation. Our exploration aspires to deepen the understanding of the profound impacts of botanical sciences on Latin America's environmental and scientific legacy, spotlighting the ongoing dialogues between science, imperialism, society, and the natural world.

Participants:

The Mothers of Colombian Botany: Reproductive Labor in the Mutisian Archive, 1760–1808 ***Austen Walker, Pennsylvania State University***

In this paper, I explore the diaries and personal

correspondence produced by José Celestino Mutis, considered the founding father of Colombian botany, during his travels and natural expeditions. I read against the grain to illuminate his reliance on domestic labor, especially the labor of Indigenous women. Though historians have done a remarkable job of reincorporating Indigenous scientific knowledge and labor into the history of South American science in the 18th and 19th centuries and demonstrating that this science was a collective enterprise and not merely the prerogative of lone geniuses, reproductive labor has not yet entered the story. In Marxist feminism, reproductive labor refers to the care work necessary to reproduce the productive labor force. I extend the meaning of reproductive labor to consider the care work necessary to produce knowledge, not just to produce goods. Centering this care work allows us to center women in the history of science, even as the men who published scientific treatises did not acknowledge women as worthy collaborators. It is clear from Mutis' writings that his botanical research would not have happened without the support of women along the way; indeed, he would not even have reached the New World without women caring for him. Hence, through the Mutisian archive, I demonstrate the importance of reproductive labor to the development of science, and thus the importance of the study of reproductive labor to the history of science.

Botanical Extractions in Nineteenth-Century Cuba ***Ana Cristina Betancourt, Yale University***

This paper explores plant collections made in 19th-century Cuba, by Charles Wright, a North American naturalist. Charles Wright was sent to Cuba by Dr. Asa Gray, to collect and catalog the island's nature. Gray wanted Wright to focus on collecting where previous naturalists hadn't. But who was Charles Wright and how did he get access to the spaces where he collected in the first place? I attempt to retell the collection histories, through the lens of 19th-century extractivism. This paper uses Wright's botanical specimens and epistolary accounts from Charles Wright to Dr. Asa Gray to identify how Wright felt during his trip and note who he encountered along the way. It begs to mention that he had three separate trips to Cuba between 1856 and 1867. Notably, all his trips were before both the Ten Years' War and the abolition of slavery in Cuba. When he would go out and collect, he would often require guides for his trips, but they would often go unnamed. I argue that Charles Wright, a white North American botanist mostly funded by sources outside of the island, was placed in an advantageous position with concern for his experience in Cuba. In an era where American expansionism was the norm, Wright used this almost imperial authority to collect, name, and explore the island's botany. Charles Wright, in the U.S., represents the enterprising nature of science, the hope of discovery and exploration, and the almost biblical labor of naming and describing species.

Transplanted Landscapes: Eucalyptus and Neocolonial Science in Nineteenth-Century Ecuador ***Ana Hidrovo-Lupera, Pennsylvania State University***

This paper explores the eucalyptus tree's journey from Australia to Ecuador, highlighting its role in the state-sponsored reforestation of Ecuador's central highlands. In 1865, the Acclimatization Society of Paris sent eucalyptus seeds that arrived in Tungurahua province. Despite challenges with transportation and poor germination, Dr. Nicolas Martinez successfully cultivated two varieties, initiating an ecological shift in the Ecuadorian highlands. Eucalyptus thrived in the inter-Andean environment becoming an indispensable resource. Despite its wood's flaws, eucalyptus became invaluable in the wood-scarce highlands for use in timber, paper, and furniture industries. Its utility transformed eucalyptus into a lucrative asset with plantations evolving into profitable enterprises. Drawing parallels with Brett Bennett's analysis of eucalyptus transplantation in South Africa, this paper examines the Paris Acclimatization Society's role as a neo-colonial agent in implementing monocropping reforestation models and delves into the nuances of technical forestry knowledge transfer in Ecuador, giving voice to the perspectives of local scientists. It also investigates local adaptions of eucalyptus's medicinal properties. Central to this paper is the notion that a plant's transformation into a commodity is not merely a change of identity but an ongoing process of evolving identity, varying with each unique historical context. The eucalyptus journey — from a natural resource to a commodity, and medicament or industrial element — traverses diverse cultural and epistemological landscapes, endowing the plant with multiple interpretations and uses. This narrative highlights the interplay between nature, culture, and knowledge in a plant's life.

Silva Coutinho's Plant: Nineteenth-Century Brazilian Science and Amazonian Geopolitics
Seth Garfield, University of Texas at Austin

Opening with an account of Harvard zoologist Louis Agassiz's scientific journey to the Brazilian Amazon in 1865-66, this paper pivots to the nationalistic agenda of his official guide, Brazilian engineer João Martins da Silva Coutinho, in leading the expedition to the Maués region, epicenter of guaraná production. The chapter argues that Silva Coutinho, linked to emergent nineteenth-century Brazilian scientific institutions, attributed a key role to guaraná, a highly caffeine-rich plant, in Amazonian geopolitics. As the "heart of the trade" on the Madeira river and the Tapajós river, two large tributaries of the Amazon that flowed northward through the province of Mato Grosso, guaraná served as an agent of Brazilian national integration. Guaraná also epitomized a purported pathway to commercial agriculture and sedentarization of the Amazonian labor force. As a crop cultivated and traded by the Sateré-Mawé, guaraná conveyed as well the potential of Native Amazonian peoples, a core tenet of Latin American indigenismo. In other words, Silva Coutinho advanced the agendas of Brazil's imperial government and nineteenth-century Brazilian scientific institutions in promoting Amazonian exploration, frontier colonization, resource extraction, and demarcation of South American international borders.

Session Organizer:
Ana Hidrovo-Lupera, Pennsylvania State University

Chair:
Seth Garfield, University of Texas at Austin

015. Science in Mexico

Contributed Paper Session
12:00 to 1:30 pm, Thursday 7 Nov.
Fiesta Americana: Lobby Level - Yucatan III

Participants:

An Oblique and Celestial Controversy in Late Colonial Mexico City and the Medium of Print
Celia Rodriguez Tejuca, Johns Hopkins University

On 3 June 1769, astronomers worldwide turned their telescopes to the heavens to follow Venus as it moved across the Sun, a celestial journey pivotal for accurately mapping the solar system. In Mexico City, polymath José Antonio Alzate used the crossing as an occasion to advocate for the science of astronomy, countering prevalent astrological readings that permeated interpretations around the nature of "New World" bodies in Europe. The production of his Suplemento a la famosa observación del tránsito de Venus provoked the response of almanac author Felipe Zúñiga y Ontiveros, who asserted his position as a capable student of the heavens via prints. This paper examines how scientific images of Venus's transit produced a public sphere by occupying an instrumental place in local debates around the utility and the technological methods of empirical observations. I argue that while the transit of Venus served as a unifying event that brought together different groups of observers around the globe, locally, this dramatic occurrence contributed to the disaggregation of distinct communities, revealing their unique positions, concerns, and uses of visual epistemic documents as ideological objects. When examined from the vantage point of Mexico City, the visual responses engendered by the event reveal a range of self-fashioning strategies and visual vocabularies much more concerned with local contentions and anxieties than with transoceanic connections. This case study thus invites us to rethink the vantage points from which global phenomena are interrogated, arguing for analyses much more circumscribed in critical local contexts of the early modernity.

Commerce and Circulation of Medical Instruments. The Case of Legay's Apparatus in a Late 19th-Century Mexican laboratory
Laura Chazaro-Garcia, Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional

Scientific knowledge and its products (theories, graphs, objects) share, among other properties, the capacity to circulate and be exchanged. From colonial times, travelers and naturalists circulated objects, plants, animals, maps, and sketches through the Americas and into Europe. This paper focuses on the circulation and commodification of scientific and medical instruments, especially those transported and commercialized in the field of medicine in Mexico, into the late Nineteenth Century. While exploring those materials, I wonder about the culture of commodification of devices used in medical research. I do not want to take their commodity character for granted, I propose to review the spaces and processes of commodification through one case; the Legay's compressed air pump), an apparatus that was acquired in France by physicians at the Laboratory of Experimental Physiology at

Mexico's Instituto Médico Nacional (IMN) in 1890. Those pumps were designed for therapeutic purposes, some physicians believed in the healing effects of compressed air for diseases like phthisis, tuberculosis. I ask how these instruments circulated between Europe and Mexico and back. I focus on space where the instruments were adopted and consumed, without forgetting that they came from other spaces, such as the international fairs where instrument makers and dealers show those artefacts. Seen from Mexico, the commercial circulation of scientific instruments has peculiar aspects of interrogation: once acquired, ¿What is its capacity to adapt? in other words, the possibility that in their new location they can be used or if they had to be re-created.

Displaying the Decease. The Mexico General Hospital and the Architecture of Science (1905) ***José Daniel Serrano-Juárez, Instituto de Geografía, Universidad Nacional Autónoma de México***

In recent years, historic research has considered the special turn to comprehend the scientific endeavor. This historiography doesn´t constrain his approach to the conviction that science is an entity spatially distributed, and, therefore, it can be analyzed by the geographic research. Also, the interpretative scale has been expanded to the analysis of the production of knowledge in architectural spaces. In that way, the historical study of the transformation of architectural spaces shows the evolution of the practices held in them and the changes that they produce in the identity of the scientists. This work aims to analyze de Mexico General Hospital architecture, founded in 1905, as a space designed for the production and teaching of the medical knowledge. It was sustained, not only in the miasmatic theory, but also in nosology practices, which includes classification and display. In that way, the new hospital model implies a new paradigm about how to organize the medical research and teaching.

The Zapatistas on the Sciences ***Alejo Stark, University of Utah***

Recent debates on the history and philosophy of science have often counterposed scientific practices to indigenous knowledge practices. For example, certain decolonial views maintain that epistemic colonization leads to processes of indigenous resistance and conceptual delinking from the sciences. In this paper, I take up the case study of one of the most well-known examples of indigenous resistance: the autonomous Zapatista communities of Chiapas, México. First, I reconstruct their view of science in recent conferences, or encuentros, organized in rebel territory with scientists, in which I participated as an astrophysicist in 2016 and 2017. Secondly, I argue that the Zapatistas' theoretical framing of their encuentros, which they named the ConCiencias — which means both With-the-sciences and Consciousness—provides a powerful counter-example to decolonial accounts of science as domination. More specifically, I show how the Zapatistas make a strong case that certain indigenous knowledge practices ("usos y costumbres") fall short of being able to adjust to changes in agriculture due to global climate change. Thirdly, I conclude with some remarks on the need to take up a history and philosophy of science "from below," which ought to begin by accounting for the effects of the sciences in situated political practices.

Chair:

Sandra Rebok, University of California, San Diego

016. Heritage, Hierarchy, and the Sciences: Revisiting 'the Impact of the New World on the Old'

Organized Session

12:00 to 1:30 pm, Thursday 7 Nov.

Fiesta Americana: Lobby Level - Yucatan IV

This panel showcases papers interested in how concepts, categories, and temporalities of knowledge were produced in encounters with cultures and/or communities in the Early Modern Atlantic World. Informed by discussions in the discipline of art history on heritage and curation, as well as by the work of historians on indigeneity, modernity, and global humanism, we ask how heritage–notions of cultural origin, possession, or patrimony–influenced domains and disciplines of knowledge during the period of European colonization of the Americas. These papers grasp beyond long-standing frameworks such as the Other, the go-between, or the 'noble savage.' Instead, they explore the diverse and particular constructions of time, representation, and identity that may disrupt larger historiographical narratives and which may still resonate today. In doing so, this panel will offer new ways into thinking about global and/or decolonial science.

Participants:

Thinking in and on the Magdalena: The Transformation of Natural History in Early Modern Spanish America ***Valeria López Fadul, Wesleyan University***

Throughout early modern Spanish rule in the Americas, the Magdalena River connected Bogotá, the administrative center of the kingdom of New Granada, with the coastal city of Cartagena de Indias. Sixteenth-and-seventeenth-century Spanish Americans expressed their understandings of the river in maps, formal inquiries, natural histories, and other compilatory works. Spanish scholars speculated about the Magdalena's nature, mapped it, and compared it to other New-World river systems. To do so, they drew from ancient and medieval European writings about the nature of rivers, the hydrological cycle, and the histories of well-known bodies of water. The knowledge they created informed their projects to transform both the riparian landscape and the people who inhabited it. By reading administrative sources alongside chronicles and natural histories, this paper argues that sixteenth-century writers emphasized that rivers like the Magdalena abounded in water to disprove ancient theories about the so-called "Torrid Zone," the part of the earth that was supposed to be scorching hot and thus unsuitable for human habitation. In the seventeenth century, scholars would still affirm the copiousness of the river, but they would bolster their argument by textual citation instead of gathering primary evidence, including oral accounts of Indigenous and Spanish experts, as their sixteenth-century predecessors had done. These new syntheses recreated an image of the Magdalena's past. As such they disregarded the ways in which the riparian landscape had changed dramatically in the hundred years or so since the first Spanish incursions.

"The New People:" Ethnogenesis and the Guaraní "Model" of Society in the 18th Century ***Mateo Mauricio Montoya, Harvard University***

There were few moments in the period of 1609-1767 when the Jesuit-Guaraní missions in Paraguay were not in an imperial, and often global, limelight. Similar to the practices of other Jesuit missions across the globe, the publication of histories, chronicles, and annual letters from the missions drew a diverse readership of both critical and fawning eyes. In the case of Paraguay, however, unique events and allegations gave readers a detailed, dichotomous portrait of a 'new' society in the Americas, founded upon a particular reformulation of classical models provided by Cicero and Xenophon, interpretations of the historical "Primitive Church," as well as Guaraní and broader Tupinamba social and familial values. Quickly, however, these values were transmuted into new philosophical concerns for concepts such as society, economy, and public happiness. This paper traces one such account, of many, namely that of Antonio Ludovico Muratori's Il Crisitanesimo Felice (1743, Happy Christianity), written as an account of the Paraguayan missions. In the hands of Muratori, among other philosopher-historians, the Guaraní were "models of all Christian virtue." But, they were also models of civil society, living a form of "liberty" understood to be both wholly different from their own historical liberty, as well as distinct from European models of good society. The supposed newness of this society, while deeply rooted in a Christian ethic of conversion, also reflected reformist visions for the capacity of both individuals and societies to make progress. They were, in essence, one of the founts which inspired Muratori's later works on the nature and improvement of society generally. While other historians have been quick to dismiss this and similar accounts as mirrors for European society, this paper places this work into literature on the emergent human sciences, who focus on ideas such as emulation, translation, and reform allow for the delicate, liminal relationship of fiction and fact, reality and exempla, utopia and reform. In so doing, the paper reconsiders the role of communities in the Americas in the formation of early discourses known today as the human sciences, and then as the sciences of government, commerce, or society.

Malleable Metals: Mapping the Economic Itinerary of the Noche Triste Bullion ***Matthew Samuel Lopez, Columbia University***

In 1981, construction workers digging under the streets of Mexico City unexpectedly struck gold. Deep in the earth, they found a mysterious ingot that had not seen light for centuries. While its precise origin was unknown, this artifact was quickly spirited away to Mexico's Museo Nacional de Antropología. In 2020, x-ray fluorescence analysis dated the bar to the so-called Noche Triste of 1520, in which the Spanish conquistador Hernán Cortés was driven out of Tenochtitlan, the Aztec city on which the modern Ciudad de México rests. Under this technical eye, the bar appeared as the melted substance of some of the first looted objects that fueled early modern Spain's insatiable desire for precious metals. This

paper addresses the economic and aesthetic questions posed by the anachronic itinerary of the Noche Triste bar. Contrasting the bar's potential destination, the 16th century Casa del Tesoro in Madrid, with its ultimate resting place, the modern National Anthropological Museum in Mexico City, it argues that the bar exchanged one epistemology of valuation for another, shifting from bullion to artifact over the course of its long slumber. In the early modern context, it links the transformation of indigenous gold objects into mobile ingots to the prevailing "mercantilist" notion that wealth was founded in the acquisition of precious metals, stressing the role that buildings such as the Casa del Tesoro played in the accumulation of sublimated indigenous artworks as bullion. While indigenous artisans valued gold for its ability to channel spiritual powers, Europeans disregarded this regime of valuation by melting looted artifacts into bars destined for distant imperial reserves. Comparing this context with the 1980s, when the bar was rediscovered, this paper argues that the architect Pedro Ramírez Vázquez's National Anthropological museum annexes the Noche Triste bar to the regime of valuation that sociologists Arnauld Esquerre and Luc Boltanski term "enrichment," where the display of "pre-columbian" artifacts as heritage is used to solicit multinational investment and tourism for the Mexican state.

Session Organizer:
Mateo Mauricio Montoya, Harvard University

Chair:
Daniela Bleichmar, University of Southern California

017. HSS Council Meeting

Business Meeting
1:00 to 5:00 pm, Thursday 7 Nov.
Fiesta Americana: Lobby Level - Salon Mérida

Chair:
Evelynn Hammonds, Harvard University

Participants:
Soraya de Chadarevian, University of California, Los Angeles
Gwen Kay, SUNY Oswego
Matthew Shindell, Smithsonian National Air and Space Museum
Emily Hamilton, University of Massachusetts, Amherst
Elise K Burton, University of Toronto
Projit Bihari Mukharji, Ashoka University
Monica Azzolini, University of Bologna
Rebekah Higgitt, National Museums Scotland
Terence Keel, University of California, Los Angeles
Harun Küçük, University of Pennsylvania
Alisha Rankin, Tufts University
Elena Aronova, University of California, Santa Barbara
Asif Siddiqi, Fordham University
Jahnavi Phalkey
Pratik Chakrabarti, University of Houston
Adrianna Link, American Philosophical Society
Patrick McCray, University of California, Santa Barbara
Samantha Muka, Stevens Institute of Technology
Omar Nasim, University of Regensburg
Jessica Wang, University of British Columbia
Fa-ti Fan, Binghamton University
Patrícia Martins Marcos, University of California, Los Angeles
John Paul Gutierrez, History of Science Society

018. Vernacular Wartime Science: Rethinking the "Centralization" Narrative of WWII from Asian Perspectives

Organized Session
2:00 to 3:30 pm, Thursday 7 Nov.
Fiesta Americana: 1st Floor - Izamal I

World War II is often seen as a moment of "centralization," when state initiatives drove scientific research and innovations amid resource shortages and massive displacement. This panel complicates top-down historiography by arguing that wartime served as a stimulating force for decentralized, informal practices that entangle indigenous knowledge and vernacular approaches, propelling an ongoing trend of mass participation in science started from the beginning of the twentieth century. Drawing upon East and Southeast Asian experience, we examine the vernacular reconfiguration of time, nature, resources, and the body under dire wartime constraints. Xinyue Zhang examines how non-expert actors in competing Chinese regimes and puppet states of the Japanese empire reimagined traditional timekeeping instruments such as sundials to fit wartime needs; Mengliu Cheng discusses a Cantonese farm owner's effort to promote an indigenous rice variety and negotiate a fluid understanding of "science" and "experiment" with scientists; Junyi Han investigates the endeavors of western engineers, Southeast Asian technicians, and indigenous labor in nudging southwestern China into the age of oil through a transnational highway network; JJ Reynolds-Strange looks at the rejuvenation of medicinal gardens as a solution to maintain pharmaceutical research for transnational corporations and professional networks when institutions faced wartime relocations to southwest China. Covering a broad spectrum of driving forces and agency – from standardization to expediency, from institutional scientists to laypeople, and the negotiations in

between – we demonstrate how a broader understanding of science helped combat scarcity and displacement and destabilize the national and colonial order imposed by war.

Participants:

Making Useful Time: Local Technologies and Time Coordination in Wartime China, 1937-1945 ***Xinyue Zhang, Yale University***

In the late 1930s, residents in Shanghai could hear the quarterly chimes of East Asia's largest clocktower at the time, a Big Ben replica, which served as an important reference for synchronizing timepieces and a material representation of the global regime of standard time. Meanwhile, some thousand kilometers away in the Communist base of Yan'an, scientists searched for methods to craft sundials even until the early 1940s to approximate standard time, due to the shortages of mechanical clocks in the region. Beneath the apparent contradictions between the modern clocktower and the rudimentary sundials lay a shared history of adapting to practical needs within material constraints during a time of war. This paper examines how local populations in China searched for useful timekeeping instruments and practices during WWII amid a fragmented political landscape where the competing regimes in China all prioritized standardization and punctuality. The local populations, especially non-expert actors such as residents and factory workers, played an active role in shaping the scientific, practical, and political implications of timekeeping during the war. This paper thereby revises conventional views of science as largely stagnant in wartime China by emphasizing the reimagination of old technologies to serve new needs in local settings.

Harnessing the Indigenous Variety: Grassroots Innovations and Lowland Rice Cultivation in Wartime Guangdong, 1940-1946 ***Mengliu Cheng, University of Pennsylvania***

This paper tells the untold story of a bottom-up campaign to promote an indigenous rice variety in wartime Guangdong. In 1940, a private farm owner, Xian Jiang, pledged to the Nationalist government in Guangdong to purchase a specific variety of rice, Xuezhan, that he had just improved on his own farm. An indigenous breed, Xuezhan could be cultivated in flooding lowlands and withstand cold weather, yet for a long time it was only sporadically grown by local farmers because of its mediocre yields and quality. The government was interested in this overlooked indigenous rice, and issued multiple experiments on it in China's subtropical regions in the subsequent years. Based on collected data, scientists in official agricultural institutes concluded that the rice did not outperform existing varieties, and offered skeptical advice regarding its large-scale promotion. However, as Guangdong plunged further into the war and suffered from severe food shortage, the rice's cold-resistant strait and lowland adaptability, which aligned well with the Cantonese government's "Winter Cultivation" campaigns that aim to expand arable land and grow rice in the winter, became appealing to a broad audience. Xian, the innovator of Xuezhan, also drawn upon commercial culture, nationalism, and personal connections-especially county-level officials who sought ways to carry out the Winter Cultivation campaign-to eventually had Xuezhan included in Guangdong's wartime plans. Redirecting attention from prestigious institutions and leading scientists, this paper reveals how the war made conditions for a fluid understanding of "science" and laypeople's participation in it.

In the Name of War: Encountering the State and Energy Transition in Yunnan, 1937-1945 ***Junyi Han, Yale University***

This project traces the energy transition in wartime China through the rise and fall of a transnational overland supply artery consisting of the Burma Road, the Ledo Road, and the Assam-Burma-China pipeline. The Burma Road was a rough-hewn highway stretched from Yunnan to Northern Burma to avoid Japanese naval blockade until Japan overran Burma in 1942. American and Chinese army engineers then began constructing Ledo Road and the Assam-Burma-China pipeline from India to join a spur of the old Burma Road in 1945. This transnational network probes how the exigencies of war shaped China's state-building and energy evolution in its southwestern regions, and how borderland communities navigated the challenges of scarce resources. This project redefines the wartime Sino-American alliance as a critical turning point in China's energy transition from coal to oil and gas. This study underscores global warfare as a catalyst for energy transition and American technological dominance in the Far East, a departure from conventional views that depict conflicts as mere interruptions. Besides, this project suggests

that vernacular industrialism was a crucial element of the state-sponsored formal industrialization in wartime China. The need to keep this wartime supply artery functioning induced widespread nativist endeavors to search for oil alternatives within well-established factories. These efforts further transformed the transportation network into a cosmopolitan site of knowledge production.

Growing Research: The Rejuvenation of Chinese Medicinal Gardens in Chinese Universities from 1935-1950 ***JJ Strange, University of Wisconsin-Madison***

The Journal of Pharmacy in China, Yaobao 藥報, published an article in 1935 by Shao Gongyou 邵公佑, wherein he extolled the virtues of having a Chinese medicine garden near a school of pharmacy and accessible for research. In 1937, he published another article titled: “China must urgently promote the cultivation of medicinal plants!” This sudden shift in tone came on the heels of the Japanese march towards Shanghai and the Republic of China government’s retreat to the southwest of China. Despite the relatively reasonable plea for growing one's research material in a time of war, perhaps stranger is the fact Yaobao was not a journal devoted to the study of Traditional Chinese Medicine (TCM) but a journal dedicated to chemical-based research in pharmacy. By using this small moment in Yaobao, a focus on garden cultivation, the value of TCM to these research pharmacists not only as an object of study but also as a way, especially during wartime, to promote pharmaceuticals that were identified as Chinese medicine in global markets. This national project of researching TCM plants for biochemically active compounds was tied to promoting Chinese medical practices as modern and safe. As more articles on garden cultivation began to appear, the anxieties and hopes that China, despite the war, would blossom into a modern pharmaceutical powerhouse were written between the lines of tending to plants. In the eyes of these researchers, the university garden was yet another tool in maintaining scientific endeavors during a time of upheaval.

Session Organizer:

Mengliu Cheng, University of Pennsylvania

Chair:

Shellen Wu, Lehigh University

Commentator:

Micah Muscolino, University of California San Diego

019. Rethinking Tradition and Novelty in Thirteenth Century Science

Organized Session

2:00 to 3:30 pm, Thursday 7 Nov.

Fiesta Americana: 1st Floor - Izamal II

This panel will explore the concepts of novelty and tradition in the Thirteenth century, as exemplified by the work of the English polymath Roger Bacon (1220-1292). Focusing on three of his sciences - astronomy, alchemy, and pharmacology - we re-evaluate the narrative surrounding his place in the history of medieval science.

Participants:

Roger Bacon, Science, and Astronomy in the Thirteenth Century ***Celina Lertora-Mendoza***

At the beginning of the Thirteenth century, Robert Grosseteste proposed a scientific methodology that fundamentally corresponds to modern science in its general scheme. His proposal for an analytical-synthetic method, the empirical refutation and the mathematization of the results, put him in a privileged position to explain the scientific events of the subsequent two centuries. Although he himself only partially applied it, his proposal had a significant echo in Roger Bacon. A topic of interest for scholars of this century is to analyze the relationship between these new methodological conceptions and their application to older areas, with a strong tradition (in the sense of Gadamer), such as Astronomy and its correlate Astrology (within the broad scope of the “occult sciences”). Roger Bacon dealt with these themes in his varied work, so a rational reconstruction (in the Lakatosian sense) is required to facilitate historiographical analysis and evaluation in the context of the period. In this work, I propose 1. A reconstruction of the systematic concept of “science” in Roger Bacon and how it encompasses Grosseteste's ideas, 2. A reconstruction of the possible meaning of applying the concept of “science” mentioned above, to the set of astronomy-astrology that in Roger is often given jointly or interchangeably, but never in a clearly positive way. An attempt is made to show both the novelty and the incorporation of tradition, thereby presenting Roger Bacon as a thinker balanced between tradition and paradigm shift.

Roger Bacon and Secrecy ***William R. Newman, Indiana University***

The theme of secrecy occupied Roger Bacon’s thinking at several levels. Not only does he

make general comments about the need for restraint in revealing the secrets of the sages, he also provides an analysis of individual techniques of concealing knowledge and even employs some of them in his writings. As I will also show, several - though not all - of Roger's techniques of concealment stem from alchemical sources. His work displays an unusual, if not unique, case of the adoption and integration of alchemical literary practices into the mainstream of High Medieval scholastic discourse.

Roger Bacon's Alchemical Pharmacology, the Prolongatio Vitae, and the Opera *Meagan Allen, Johns Hopkins University*

The Opus maius is the earliest known work in which Bacon discusses the possibility of prolonging human life. It is also, in many ways, the most dissimilar to his other works on medicine. The Opus maius provides little role for alchemy within the prolongatio vitae; alchemy is reduced to the production of purer forms of gold. This differs significantly from the prolongatio vitae found in the Opus minus and Opus tertium, in which alchemy teaches not only about the transmutation of metals, but also the creation of a perfect medicine: a corpus equale – a body in which all four elements are found in equal proportion, and thus have no action upon each other. I will argue that Bacon deliberately omits alchemical pharmacology in the Opus maius because he wants to give his patron an example of what the prolongatio vitae can offer, without exposing its true alchemical nature, which he will reserve for the Opus minus and Opus tertium.

Session Organizer:
Meagan Allen, Johns Hopkins University
Chair:
Nicola Polloni, Universita di Messina

020. Beyond Orientalism(s): Rethinking Approaches to Islam and the History of Science
Organized Session
2:00 to 3:30 pm, Thursday 7 Nov.
Fiesta Americana: Lobby Level - Salon Celestun

Over the last few decades, the ideological origins of the History of Science have come under increased scrutiny. As the HSS Centennial coincides with a period of particularly acute Islamophobia, this panel reflects on the fraught relationship between "Science and Islam" and how we can move beyond the orientalism that has haunted the field since its founding. The papers on this panel are focused on addressing different aspects of the history of epistemic violence against scientists, scholars, and other kinds of knowers from the Islamicate world and how this has been embedded in our histories, historiographies, and methodologies in the History of Science. This panel brings together work that focuses on different historical moments (classical, post-classical, 19th century, and 20th century), different sciences (astronomy, mathematics, evolutionary theory, and microbiology), and different methods (disciplinary historiography, the history of epistemic practices, biography, microhistory, and STS). In her paper, Aneka Kazlyna offers a retrospective on how early historians of science were intensely interested in the history of astronomy, but also grafted on orientalist mythologies with which we are still grappling. Julia Tomasson shows us how the post-classical mathematical sciences shared a set of epistemic practices with the "rational sciences" such that in this period, their study cannot be separated from Islamic theology and jurisprudence. Sarah Qidwai explores the historical and historiographical relationship between Islam and Science in the case of colonial South Asia through the life and ideas of reformer and philosopher Sayyid Ahmad Khan (1817-1898). Lastly, Marjan Wardaki traces a microhistory around the microbiologist 'Abd al-Rahman Khan (b.1909) whose education and work connected him to local communities in Germany, Afghanistan, and India. The panel hopes to invite further discussion on shared questions: How might we study the Islamicate world on its own terms and with what methods? What is particular about the epistemic violence we are describing and hope to redress? What can be generalized to non-Western/non-European sciences more broadly?

Participants:

The History of Science and the History of Astronomy *Aneka Kazlyna, Princeton University*

This talk scrutinizes the relationship between the history of science and the history of astronomy from its early encounters. Through an examination of archives, I explore how historians of science have studied the history of astronomy and place them in conversation with current questions in the subfield. I will show how early historians of science were intensely interested in the history of astronomy and broader exact sciences, but often also incorporated Orientalist frameworks in their analyses. In the second part of this talk, I will delve into astronomical manuscripts to show how we can move beyond these epistemological frameworks to study knowledge production on its own terms. In light of the centennial of the History of Science Society, this paper sheds light on these early

developments and what they tell us about disciplinarity. What methods and approaches might we use to study the history of astronomy anew?

Mathematics as a "Rational Science": Epistemic Practices in Post-Classical Islamic Mathematics ***Julia Tomasson, Columbia University***

The period after the so-called "Golden Age of Islam" has been largely dismissed as a period of radical "decline" often blamed on the "dogmatism" of Islam and evidenced by a deluge of derivative commentaries of their more illustrious predecessors with little original work of their own. Recent trends in post-classical (~14th-18th centuries CE) Islamic intellectual history, however, have sought to reclaim this period as intellectually dynamic with a set of epistemic priorities that were coherent, albeit different from our own. In this talk, I look at a set of mathematical manuscripts on geometry to show that these were not "mere commentaries." By focusing on the mathematical and epistemic practices we find traces of in these manuscripts, I argue that contrary to earlier conceptions and practices of mathematics, post-classical Islamic mathematics was considered part of the "rational sciences" (with logic, dialectics, language sciences, theology, jurisprudence) rather than the natural sciences. The historiography of Islamic mathematics and astronomy often go hand in hand under the label "the history of the exact sciences." Post-classical Islamic mathematics was still an "exact" science, but in this period, "exactitude" sided with the rational sciences with their precise self-conscious methods, as opposed to the experimental sciences like astronomy, which was always an imperfect reflection of reality. We see that these mathematicians had a different conception of proof that was grounded in different traditions of logic and styles of reasoning that do not fit neatly into our current histories and philosophies of mathematics.

Revisiting Narratives: Sayyid Ahmad Khan and the Intersection of Islam, Science, and South Asia ***Sarah Qidwai, University of York***

This paper critically examines the intricate relationship between Islam, science, and the historical narrative, focusing on the pivotal figure of Sayyid Ahmad Khan in nineteenth-century South Asia. Decentering the earlier period and geographical confines of the Middle East, Ahmad Khan's multifaceted legacy as a scholar, reformer, and educationist within colonial India significantly impacted the discourse on Islam and science. By critically examining Ahmad Khan's ideas and initiatives within the specific socio-political context of nineteenth-century South Asia, this study underscores the need for a nuanced approach to the historiography of Islam and science. It highlights the dynamic interplay of local contexts, intellectual currents, and individual agency, enriching our understanding of the complex dynamics shaping the history of science in Islamic societies and its broader global ramifications.

The Migrant Pathologist and the Making of Mobile Ḥakīmas in South Asia, 1919 – 1960 ***Marjan Wardaki, Washington University in St. Louis***

The movement and circulation of ideas and scientists have long been an inherent part of Science and Technology Studies (STS), but disciplinary barriers and nation-centric frames have prevented us from understanding how migrants from across the Global South and the knowledge structures they bring with them shape the contours of scientific knowledge in different regions. To what extent do Islamicate knowledge structures inform migrants' engagement with science and technology in their new societies? What collaborators, networks, and institutions help them circulate ideas and objects across geographic and intellectual terrains? This paper proposes an original concept of "scientific diaspora," to examine a heterogeneous group of South Asian scientists and their scientific training at German universities. Through a microhistory of the work of 'Abd al-Rahman Khan (b.1909), a migrant and microbiologist who trained at the Hygiene Institute of the Friedrich-Wilhelms-Universität of Berlin, this paper shows how migrants problematized Robert Koch's preferred medium of agar to developed alternative medium for culturing and controlling bacteria. The paper connects his early formative years in Berlin to the birth of various medical centers across Afghanistan and India, which relied on women as essential labor. Inside the medical facility, ḥakimas fulfilled the important work as radiologist, nurses, and laboratory technicians, but outside the laboratory, they traveled by van through cities and villages, entering private domains. This opens up a world of what Steven Shapin has called "invisible technicians," or mobile

ḥakimas, as I propose.

Session Organizers:
Julia Tomasson, Columbia University
Aneka Kazlyna, Princeton University

Chair:
Ahmed Ragab, John Hopkins University

021. Rural Healthcare

Contributed Paper Session
2:00 to 3:30 pm, Thursday 7 Nov.
Holiday Inn: Lobby Level - San Jacinto

Participants:

Petitioning for Rural Healthcare in Twentieth-Century Oaxaca, Mexico ***Marissa Nichols, Emory University***

In the 1930s and 1940s, Indigenous empiric nurses, or those who learned through practice and experience, labored alongside medical students in the southern state of Oaxaca, Mexico. Medical students arrived in rural communities as part of federal efforts to address the uneven distribution of health services in urban and rural areas. Their reports often included tales of resistance from Indigenous healers and communities, largely in part because they were specifically asked to do so. However, municipal authorities actively sent solicitudes (requests) and denuncias (complaints) that document the ways that Indigenous communities actively petitioned for state-sponsored clinics, practitioners, medicine, vaccines, and supplies in mid-century Oaxaca. They selectively supported and engaged with the state's rural health projects while making claims to health-based rights which continued to expand following the military phase of the revolution. To combat an overemphasis on conflict, this paper relies on medical theses, solicitudes, and denuncias found in state and municipal archives to understand how Indigenous nurses and communities responded to and produced new knowledge in the face of the state's expanding rural health projects.

The Mobile Clinic: Planetary Tales and Cerebrospinal-Meningitis in Nigeria's Transient Medical Space ***Aka K Eze, Massachusetts Institute of Technology***

Episodic outbreaks of Cerebro-Spinal Meningitis (CSM) dotted the history of infectious diseases in Northern Nigeria. However, CSM was a fleeting disease:it followed weather patterns and climatic conditions. As a disease that changed from latency in the rainy season to an active bacterial epidemic in the dry season, CSM proved unconventional in the history of disease intervention in colonial Nigeria. It required the colonial government to survey the weather conditions and advise Northern Nigerians about heatwaves, colds, and possible outbreaks, mainly through repeated radio broadcasts. However, more than this, it also required the government to ready a make-shift public health intervention in the case of emergencies. This demand, though tenacious, became a test of the colonial government's rhetoric of care in its colony due to the epileptic health care services, poor disease surveillance, and poor infrastructure in the region. Against this backdrop, this research will examine the recursive outbreaks of CSM in Northern Nigeria between the 1930s and 1940s. Through the history of CSM, The Mobile Clinic assesses the paradox of care, medical professionalization, and the denationalization of the Zaria School of Pharmacy in the interwar years. Also, it will explore the post-war period emergence of global health institutions such as the World Health Organization and how the fight against CSM became enmeshed in the planetary narratives of climate change. Reports on colonial geographical surveys of Northern Nigeria, colonial archival health records, newspaper reports, United Nations files, and other secondary sources will be utilized to interrogate interventions into CSM in Nigeria.

Isolation to Innovation: Rural Healthcare for Maine's Queer Community in the 1980s and '90s ***Hailey Davis, Yale University***

The urban-rural divide significantly influenced queer individuals' access to healthcare resources in 1980s and '90s Maine. This analysis explores the operational dynamics of Northern Lambda Nord (NLN), a rural queer community health organization spanning Aroostook County in Maine, USA, and New Brunswick, Canada, for over two decades. Founded in the 1980s, NLN emerged to provide social support, health resources, and increased visibility for the queer population in a region characterized by geographical isolation. The organization's efforts to cultivate community, promote acceptance, and address healthcare disparities contribute to broader discussions around diversity, equity, and inclusion in public health and social policy. NLN's pioneering initiatives, such as establishing Maine's first gay and lesbian phoneline, which later became Maine's official HIV/AIDS Hotline, and advocating for LGBTQ+ rights locally and statewide, underscore the critical role of community-based organizations

in addressing healthcare for minority rural populations. Despite facing discrimination and resource constraints, NLN's resilience and innovation exemplify broader efforts toward social justice and equitable healthcare access. These efforts also reflect members' concerns about privacy, especially in regions historically lacking support for stigmatized identities. This narrative highlights NLN's evolution from a grassroots support network to a bilingual outreach organization as members navigated cross-border interactions and legal barriers. NLN's challenges in sustaining visibility and community cohesion amidst outmigration and digital transformations resonate with ongoing discussions on the spatial dimensions of queer identity and the impact of technology on community-building and health equity efforts. This analysis traces the construction of queer identity alongside geographic affiliation and the ways in which health networks formed and extended to meet the needs of those who diverged from normative sexual expectations.

The Ethiopian Health Extension Programme as Travelling Model ***Sarah Howard, Birkbeck, University of London***

Ethiopia’s health extension programme is held up by health policy makers as a model for reducing maternal and child morbidity and mortality. Deploying two female health workers in each sub-district with responsibility primarily for preventative health measures, an important distinction from the majority of other health extension programmes in Africa is that its workers are state employees, although, as elsewhere, voluntary labour is envisaged as integral to the programme. Drawing on an oral history witness seminar with senior health officials from across Africa held in September 2023, this paper will make two interventions, looking at firstly, how this remarkable public health achievement arose in the Ethiopian context, with origins both in the socialist era (1974-1990) and in the developmental state of the Ethiopian Peoples Revolutionary Democratic Front (EPRDF) government (1991-2018). Secondly, the paper will discuss the health extension programme’s explicit positioning as a model across Africa and beyond, including in Britain’s National Health Service. Despite evidence of its success in improving public health indicators, interconnected political imperatives, human resource questions and complex questions of legitimacy and participation have complicated the translation of this model into practice elsewhere.

Chair:

Tess Lanzarotta, Denison University

022. Plants and Power: Unearthing Authority and Control in the History of Botany I

Organized Session

2:00 to 3:30 pm, Thursday 7 Nov.

Holiday Inn: Lobby Level - Santiago

[Part I of Double Session] While historical and sociological reflections of biology have long been characterized by a bias towards the animal kingdom and largely neglected the intricate history of plant biology, the last years have been marked by a vegetal turn across the humanities. But still, the history of botany remains most widely an underdeveloped field today. In this double sessions, we want to explore the complex history of botany through the lens of power structures that shaped and still shape botanical institutions and practices. Possibly, more than any other biological field, botany strongly depended on and was influenced by asymmetrical power relations, colonial entanglements and the exploitation of various social and ethnic groups, including of indigenous knowledge. In the session, we want to identify centers of power and explore the various roles marginalized groups in Latin America and (South East) Asia played in producing botanical knowledge during the mid-19th to mid- 20th centuries. First, by following the traces of individual plant collectors like Percy H. Gentle, Margery Carlson and Ynés Mexía (Baedke’s, Straetmanns’ and Gianquitto’s papers), this session unearths their often uncredited contributions to the buildup of botanical knowledge and collections and sheds light especially on the role of women and local collectors in colonial practices of botany. Second, the session focuses on the intersection of Western scientific systems and indigenous knowledge about plants (Goss’, Uchôa´s and Smocovitis’ papers). This includes efforts to validate indigenous plant-based medicinal practices within a Western scientific framework in late-colonial and post-colonial Indonesia; the relation between the concept of “savage knowledge” and the emergence of the field of ethnobotany in the Amazon region; and questions about ownership, nationalism, and the exploitation of natural resources, underlying the US "Cinchona Missions" in Latin America. In sum, this session aims to uncover social, political, and economic hierarchies and power relations that constituted the production of botanical knowledge from the late 19th to mid-20th century. In this context, it also explores new digital approaches to identify and make visible forgotten actors in the history of botany.

Participants:

Trails of Discovery: Percy H. Gentle, Elias Contreras, and the Lost Legacies of Local Plant Collectors on the Yucatan Peninsula, 1930-1978 ***Jan Baedke, Ruhr-University Bochum***

Since the early 20th century, comprehensive botanical expeditions were organized to explore the Yucatan peninsula. By the late 1920s, these endeavors had started to focus on the little known Maya regions between Mexico, Guatemala and British Honduras (now Belize). This paper focuses on the role played by today forgotten local collectors in gathering valuable botanical but also archeological knowledge in the former Mayan territory. It especially discusses the contributions of Percy H. Gentle (1890-1958) and Elias R. Contreras (1922/23-?). Gentle was a black plant collector from British Honduras, who worked with Harley Harris Bartlett and Cyrus Longworth Lundell in Petén (Guatemala) and British Honduras between 1931 and 1936. Sponsored by Lundell, Gentle continued independent exploration until his death. He amassed around 10,000 specimens (including 153 new taxa), which established him as Belize's leading flora collector and one of the most prolific in the Yucatan peninsula. From 1959 until 1978, the local farmer Elias Contreras from Petén (Guatemala) collected for Lundell another ca. 7000 specimens. He also contributed in important ways to the archeological and ecological projects at the Tikal ruins in the 1960s-70s. Despite their contributions, Gentle, Contreras, and other (often indigenous) collectors remain largely forgotten today. By drawing on expedition reports, archival material and especially by unearthing the digital trails collected plants left in today's virtual herbaria and biodiversity collections (e.g., SERMEC, iDigBio, GBIF, Tropicos), I reconstruct the contributions of local collectors to specific botanical expeditions as well as to important (re)discoveries of Mayan ruins. More generally, this paper reflects on labeling practices in plant collection, how indigenous knowledge gathered by local collectors was lost, and on the power structures that made invisible the valuable contribution of these collectors to current conservation and biodiversity projects.

"No Work for a Softy“: Margery Carlson and Her Botanical Expeditions in Mexico and Central America ***Vera Maximilia Straetmanns, Ruhr-University Bochum***

Women have been marginalized throughout the history of science – and this is also true for the history of botany. However, compared to other areas of natural science, botany always had a remarkably high number of female researchers, collectors and illustrators, albeit generally considered only amateurs and pastime botanists by their male contemporaries. When, beginning in the middle of the 19th century, women finally were granted access to academic institutions and societies, many pioneering female academics entered through plant related fields. In this paper, I want to focus on one of these pioneers from the botanical field: Margery Claire Carlson (1892-1985), first full-time female professor at Northwestern University, Illinois, and first woman to lead a scientific expedition into the mountains of El Salvador. Together with her partner Kate Staley, she undertook numerous expeditions between 1945 and 1958, mainly in Central America, where they collected thousands of plant specimens and discovered new species. Drawing on archival material like letters and newspaper articles as well as digital virtual herbaria and biodiversity collections, I reconstruct Carlson´s career path, her botanical expeditions and the ways in which she contributed to broadening the knowledge about the South-American flora. On more general lines, the paper reflects on the history of female plant collectors especially in the context of colonialism as well as the dynamic power relations between collectors, institutions and scholars.

Ethnobotany, “Savage Knowledge,” and the Colonial Ways of Extracting Indigenous Knowledge in the Amazon ***Raphael Uchôa***

This paper explores the intricate relationship between the concept of “savage knowledge,” its significance during the nineteenth and twentieth centuries, and the emerging field of ethnobotany. It specifically focuses on the Amazon region as a pivotal area in the development of the ethnosciences, examining the contributions of the naturalists Richard Spruce, and Richard Schultes, who each conducted scientific and ethnographic expeditions to the Amazon between the 19th and 20th centuries. Their works are crucial in reevaluating the dynamic interplay between the Western perception of the “savage,” the scientific principles that underpin it, and the asymmetrical geopolitics of knowledge exchange between countries in the global north and south. I argue that the contextual conditions which made possible the emergence

of ethnobotany as an imperial area of investigation – including imperial assimilation, extraction, and coloniality – continue to exert influence on twentieth-century political discourses concerning the integration of indigenous cultures into global politics. The study concludes that the incorporation of indigenous knowledge, systematised by the ethnosciences, has often served as a pretext for controlling geographical areas historically regarded as “natural resources,” ultimately transforming them into reservoirs of indigenous epistemologies.

Session Organizers:
Jan Baedke, Ruhr-University Bochum
Vera Maximilia Straetmanns, Ruhr-University Bochum
Vassiliki Betty Smocovitis

Chair:
Donald L. Opitz, DePaul University

023. The Future of Latin American in the History of Science: Emerging Scholarship from the Americas
Organized Session
2:00 to 3:30 pm, Thursday 7 Nov.
Fiesta Americana: Lobby Level - Yucatan I

This panel highlights the work of PhD students from throughout the Americas to foreground new directions in the history of science. At a meta-level the panel is interested in how our own history of science field operates in different locales and how our historical conversations can take shape across our differences. Especially notable is the panelists' attention to the "other than human" and to whether and how people, plants, animals, and things circulate. The papers look at how science emerges from human interaction with streetlights and slaughterhouses, magic mushrooms and other psychoactive plants, and animals such monkeys. The papers probe the circulation of knowledge across different geographic areas but also among differently situated human subjects with unequal access to wealth and scientific prestige. Vilgiate looks at relations among national states, indigenous people and foreign researchers. Godoy Yañez looks at how judicial proceedings shape expert and lay knowledge and the sensory perceptions that underlay that knowledge. Cuanal Cano focuses on how ability to transport the monkeys needed for the production of polio vaccines operated alongside the ability to determine norms of production to shape Mexican, US, and European science and health. At a meta-level the panel explores how our own history of science field operates in different locales and to think about how our historical conversations can take shape across our differences.

Participants:

Situated Questions in Entangled Archives: The Monkey Politics of Vaccines against Poliomyelitis in the 20th Century ***Deyanira Cuanal Cano, Universidad Autónoma Metropolitana-Cuajimalpa***

The Construction of Risk in/of Modern Urban Spaces and Artefacts Based on the Formation of Sensory Perceptions as Scientific Evidence in Courts. Santiago, 1880-1910 *Eduardo Andrés Godoy Yáñez, Universidad Andrés Bello*

This paper brings together the history of knowledge, the history of the senses, and urban history. It asks how scientific and lay knowledge constructed the sensory perceptions of modern risks related to diverse urban spaces and artefacts in Santiago between 1880 and 1910. The papers starting from the premise that expert and popular notions and sensible experiences of risk determined and depended on the interactions between science, the law and customs. During this period, the Chilean state sought to buttress hygienic institutions that could regulate and analyze risk using public laboratories. These laboratories were used courts of justice and therefore delineated the contours of evidence based on scientific practices. The paper analyzes the sensory perceptions of diverse subjects that on a daily basis interacted with, moved alongside, and analyzed spaces such as markets and slaughterhouses and diverse objects such as gas lighting, and bottles of medicines. The sensory experiences of these people can be found in 25 judicial proceedings that discuss urban risks. The paper analyzes them to determine how the different sensory perceptions at play in the ideas and practices caution surrounding certain urban spaces and artifacts. The paper underscores the underlying rationality that made it possible for these perceptions to constitute allowable evidence in a judicial arena that ranked them hierarchically. In this fashion, the paper illuminates the crucial role that urban space played in modern experiences of risk at the turn of the twentieth century.

Beyond María Sabina: Psychedelic Plant Research in the Sierra Mazateca, 1926-1962 ***Timothy James Vilgiate, University of Texas at Austin***

The story of US-born amateur ethnomycologist R. Gordon Wasson’s 1957 Life magazine photoessay depicting a “magic mushroom” ceremony led by Mazatec curandera María Sabina has long occupied a central place in the

historiography of psychedelics, and continues to play an important role in conversations surrounding reciprocity towards Indigenous communities as mainstream interest in psychedelic science grows. This paper aims to highlight the networks of intermediaries and collaborators that enabled Wasson's research in the first place, including Indigenous schoolteachers, coffee planters, and Mexican anthropologists. Besides considering a broader range of actors, I also consider Wasson's less-studied work on psychoactive flora like naxóle Natjaoná (Rivea corymbosa) and ndí xka Pastora (Salvia divinorum), contexualizing interest in such plants in relation to the overarching concerns of post-revolutionary Indigenista development projects in Mexico. I begin with the first published mention of Mazatec psychoactive plant use, a 1926 report from a Secretaria de Educacion Publica cultural mission to Huautla de Jiménez, Oaxaca, and conclude by highlighting Indigenous perspectives on the legacies and impacts of scientific research in the region.

Session Organizer:
Karin Rosemblatt, University of Maryland

Chair:
Karin Rosemblatt, University of Maryland

024. Ecology and Environment

Contributed Paper Session
2:00 to 3:30 pm, Thursday 7 Nov.
Fiesta Americana: Lobby Level - Yucatan II

Participants:

Medical Man Adapting: the development of René Dubos' social and ecological vision of health. ***Genevieve Dally-Watkins, Harvard University***

Soil microbiologist and social theorist René Dubos (1901-1982) spent most of his career exploring how ecological conditions and social decisions influenced human and planetary health. Most analyses separate out the sociological and environmental features of Dubos' work. By contrast, this paper will explore how those two categories intersected and the ways in which Dubos' perspective on them changed over time. My analysis plays out across three movements. I begin by analysing how Dubos' exposure to parasitology at Harvard (1942-1944) led him to propose that pathogens and humans normally coexisted. Dubos hypothesised that diseases only occurred if environmental or nutritional stresses were placed upon host-parasite relationships. This was a particularly theoretical perspective on environmental and social features of health. However, it lay the foundation for the microbiologist's proposal that climactic and class conditions caused tuberculosis rates to be higher in specific sectors of urban populations. I examine how Dubos supported this thesis through historical analysis in the second section of this paper. What becomes increasingly apparent throughout this movement is Dubos' rising realisation that industrialism exposed people to totally novel and harmful pollutants. In the final part of his career, he moved from historical appraisals of this issue to contemporary reviews of pollutants' medical consequences. The last part of my paper explores Dubos' perspective on the risks posed by pollutants and ecosystem alterations between 1965 and 1980. While social critiques were less sharp in this final period of Dubos' career, his environmental reviews inspired current fields that consider the medical consequences of climate change. Ultimately, analysing Dubos' work highlights how he perceived disease to be a consequence of social and ecological factors that played out across individual, group, and global scales.

Marine Ecological Scenarios from the Past: Pietro Parenzan's Dredging Records (1930-1935) ***Alessandra Passariello, Stazione Zoologica Anton Dohrn***

Once they used to be 1000, but only 500 now survived. While the first ones were meticulously annotated, with detailed notes on water temperature, depth and geographical position, the last ones show clear signs of fatigue, perhaps listlessness. Imperfect though they might be as historical sources, the dredging records filled by the Italian scientist Pietro Parenzan on the basis of benthic assays carried out between 1930 and 1935 in the Gulf of Naples, document the heterogeneity of animal and vegetal communities that populated its depths. The records are today part of the Historical Archives of the Stazione Zoologica Anton Dohrn, the institute that from 1930 to 1935 hired Pietro Parenzan to conduct a systematic zoological campaign of the Gulf of Naples: they tell us about the different tools for exploring the seabed, about toponyms that have fallen into disuse today, about the emergence of the concept of "biocenosis" in marine sciences and of many other aspects of scientific practice at sea. Taking advantage of the increasing attention that historical data on past ecological scenarios are receiving in the community of historians of science, I focus on

the material and intellectual context of production of the naturalistic data produced by Parenzan. I also emphasise how these data might be used to enable scientists refine ecological baselines that inform our understanding of changes in local biodiversity and our conservation and restoration objectives.

Tracing Exposure: Land-Air Relations as Chokepoints in Rethinking Ecosystems ***Cynthia Browne, Max Planck Institute for the History of Science***

With the emergence of radioactive isotopes as part of experimental systems in the 20th century science, practitioners acquired a new space of representation that allowed metabolic pathways to be mapped by spatializing temporal processes as a cycle. Within recent developments in epigenetics, this new epistemic space within molecular biology not only opened up possibilities for rethinking metabolism as a regulatory interface at the level of the body and its molecular politics; it also enabled a "molecularization" of the environment produced in and through experimental models of exposure (Landecker 2011) This paper draws upon this notion of the "molecularization" of the environment to examine two interrelated trajectories: 1) it explores how tracing technologies helped to "molecularize" ecosystems as cyclical, homeostatic systems through an experimental culture that released radioisotopes into surroundings in order to follow them, and 2) how the materialization of radioactive isotopes in Alaska and Sweden in the 1960s instead exposed how the ecology of land-air relations among certain Indigenous groups produced what I call "chokepoints." Such chokepoints trouble the concept of ecosystem as a harmonious cycle by making visible the uneven and unequal distribution of radioactive isotopes within the "planetary politics" of exposure (Masco 2021) in the wake of above-ground nuclear detonation. Making this exposure public catalyzed acknowledgements of responsibility by scientists and calls for intervention into these communities. Such interventions proposed to protect these communities by severing their ecological Land relations, thereby reproducing through "care" the same structures of (imperial) violence that unleashed these isotopes into the biosphere.

Necropolitics of Environmental Protection in Pahlavi Iran ***Gunha Kim, University of Toronto***

Is economic disadvantage the only factor preventing the Global South from participating in international environmental initiatives? This paper builds on postcolonial studies of science that have examined the politicization of environmental engineering in nation-building within the Global South. It traces how Pahlavi Iran relied upon necropolitical violence in its pursuit of global environmental preservation agendas during the two decades before the 1979 Iranian Revolution. The pollution crisis in Iran, which escalated to the level of mass suicide, was attributed to various social segments, such as clergies, anti-government students, and the urban lower class—key actors of the later revolutionary movement. I suggest a form of necropolitics that works by eliminating the population that is supposed to benefit from environmental protection. It is understudied that Iran was one of the leading countries in the 1960s and 1970s when the current notions of global pollution were in the making. The Pahlavi government funded the United Nations' International Environmental Award and hosted the Convention on Wetland Protection in Ramsar. Eskandar Firouz, Iranian Chief of the Department of Environment was elected as President of the International Union for Conservation of Nature and Natural Resources. These commitments, however, halted after 1979, defying the appeals of the United Nations. Challenging the simplistic narratives of Iran's shift towards illiberalism, this paper investigates how these ostensibly benevolent international commitments were implemented at the domestic level. Specifically, I scrutinize the discourse within the journal Shikār va Ṭabī'at [Hunting and Environment], a state effort to provide scholarly underpinnings to nascent environmental protection endeavors heralded by the restrictions on hunting. Also, I examine other periodicals and newspapers, in which Iranian "environmentalists" engaged with more public forms of writing.

Chair:

Frederick R. Davis, Department of History, Purdue University

025. The Science and Politics of Agriculture in the Global South

Contributed Paper Session
2:00 to 3:30 pm, Thursday 7 Nov.
Fiesta Americana: Lobby Level - Yucatan III

Participants:

Discovering the Obvious: Indigenous Peruvian Farmers and the Reassessing of Native

Potatoes ***Alejandra Osorio Tarazona, Max Planck Institute for the History of Science***

Potatoes were first domesticated in the Peruvian Andes around 10,000 years ago. Today, over 3,500 varieties of potatoes are grown in the country. Indigenous farmers cultivate most of these varieties at altitudes above 3,000 meters. Although these farmers now also cultivate improved potato varieties, they still use traditional techniques rooted in the Andean indigenous agriculture system to grow native varieties. The latter are grown on small plots without modern fertilizers or pesticides, using crop rotation and seed exchange between families. Initially, native potatoes were grown for self-consumption and exchange with other communities. However, today, farmers collaborate with scientific institutions in biodiversity conservation projects and are developing strategies to increase the consumption of native varieties outside their communities. However, for a long time, development projects looked to replace native potatoes with improved varieties. Between the 1940s and 1980s, these projects sought to modernize Peruvian indigenous communities and their agricultural practices, downplaying the role of native crop diversity inherent in their farming system and dietary practices. Only in the 1980s did scientists reassess Peruvian farmers as important knowledge producers and recognize the efficiency of their farming system. This presentation examines ethnographic records of indigenous communities and scientific reports to trace the scientific community's reassessment of native potatoes. It explores how these crops, once ignored outside their communities of origin, have become a focal point of scientific interest for local and international communities.

Mexican Agri-cultures of Resistance: The Green Revolution, Plan Puebla, and Grad Student Agronomy ***Paul Vieth, University of Oklahoma***

My proposed presentation examines the counter-hegemonic and decolonial agricultural technologies and techniques and agri-cultures (the social, political, aesthetic, ethical, and epistemic cultures that produce and are produced by those technologies and techniques) in late 20th-century, post-Green Revolution (GR) Mexico. Specifically, I analyze the roughly 70 MA and PhD student agronomy theses that used the Plan Puebla development project (1967-1994) as the basis for their graduate research at Mexico's National School of Agriculture, Chapingo. Despite Plan Puebla's original institutional connection to the GR it later came to represent an alternative path of technological change and economic development than the GR's rooted in the Global Northern Cold War calculus of modernization theory. Chapingo students used Plan Puebla as a laboratory for experiments in technoscientific agronomy that would have been considered cutting-edge in the premier institutions of US agronomic education, like using multiple regression analysis to generate agrosystems and the application of game theory and Bayesian models to farmers' decisions. But they also used Plan Puebla to conduct experiments with counter-hegemonic technologies and techniques — like biological fertilizers, animal power, and polyculture — that undermined multinational agribusiness interests in synthetic chemical fertilizers and biocides and in electro-mechanical traction and automation. This paper uses digital humanities methods like co-citation analysis of these theses and social network analysis of thesis committee members to analyze the intergenerational dynamics of knowledge flow within the discourse community of Plan Puebla. I argue that counter-hegemonic agricultural epistemes inculcated in Mexico by the perceived epistemic and commercial colonialism of the GR and the industrialization it engendered were instrumental to the creation of novel agroecological and regenerative agricultural technologies. Despite Plan Puebla's original institutional connection to the GR it later came to represent an alternative path of technological change and economic development than the GR's rooted in the Global Northern Cold War calculus of modernization theory. Chapingo students used Plan Puebla as a laboratory for experiments in technoscientific agronomy that would have been considered cutting-edge in the premier institutions of US agronomic education, like using multiple regression analysis to generate agrosystems and the application of game theory and Bayesian models to farmers' decisions. But they also used Plan Puebla to conduct experiments with counter-hegemonic technologies and techniques — like biological fertilizers, animal power, and polyculture — that undermined multinational agribusiness interests in synthetic chemical fertilizers and biocides and in electro-mechanical traction and automation. This paper uses digital humanities methods like co-citation analysis of

these theses and social network analysis of thesis committee members to analyze the intergenerational dynamics of knowledge flow within the discourse community of Plan Puebla. I argue that counter-hegemonic agricultural epistemes inculcated in Mexico by the perceived epistemic and commercial colonialism of the GR and the industrialization it engendered were instrumental to the creation of novel agroecological and regenerative agricultural technologies.

The Rockefeller Foundation and Maize Preservation in the Green Revolution *Emilie Josephine Raymer, Harvard College*

During what is often referred to as the "Green Revolution," governments and private institutions attempted to increase global crop yield by promoting the use of modern agricultural methods, such as pesticides and mechanized farming. During this same period, during the 1940s through the 1970s, scientists also recognized that indigenous varieties of maize were quickly becoming extinct because of urbanization and changing farming practices. In response to these concerns, American scientists, who included agronomists and botanists, created the Committee on Preservation of Indigenous Strains of Maize (CPISM), which was formed under the auspices of the National Academy of Sciences' National Research Council and was funded, in part, by the Rockefeller Foundation. Members of the Committee organized maize collection efforts throughout Central and South America, as well as the Caribbean, and while the "Green Revolution" has received much scholarly attention, the efforts of the CPISM have received considerably less. In this talk, I focus on the ecological and cultural idea of isolation, which was repeated throughout CPISM reports. I argue that CPISM researchers emphasized that indigenous strains of maize had been formed within ecologically and culturally secluded areas—and that because these barriers were being eroded, only a sophisticated scientific apparatus could adequately preserve these valuable maize varieties. I place this effort within the broader movement of "salvage biology" and "salvage anthropology," in which American academics and specialists mobilized to extract of artifacts, resources, and specimens from areas and populations deemed to be endangered. The movement has since faced criticism.

'Agriculture is a scam!': Climate Change, Agrochemicals and the agrarian fallacy among African grain farmers in Zimbabwe, the 1950s to 1979. *Bryan Umaru Kauma, Southwestern University*

On June 14, 1954, the Matobo Research Station launched a hybrid SR52 maize seed onto the local market. This introduction was aimed at boosting African grain production and thus complemented the variety of agrochemicals including fertilizers, and insecticides already in wide use by African farmers. Yet still, the results remained egregious. Relying on a combination of primary sources including oral histories, crop survey records, official reports and newspaper articles, this paper demonstrates African farmers' multilayered experiences with agrochemicals in Zimbabwe over the colonial period between 1950 and 1979. It shows how most agrochemical innovations including fertilizers, hybrid seeds and pesticides did little to offer a lasting solution to the African agricultural and food problems. If anything, they churned out a myriad of challenges to farmers culminating in both food and environmental poverty. The adoption of modified hybrid seed and fertilizers became increasingly associated with the growing toxic footprint of incessant low crop yields, declining crop and human nutrition levels as well as triggering a series of violent cultural clashes over the use of 'foreign ideas' in African agriculture. Using a historical lens, this paper triggers us to rethink the contributions of agrochemicals as a solution to agriculture and food insecurity in the age of the anthropogenic slow violence of climate change.

Chair:

Koyna Tomar, University of Pennsylvania

026. Mobility and Expertise in Early Modern Mining

Organized Session

2:00 to 3:30 pm, Thursday 7 Nov.

Fiesta Americana: Lobby Level - Yucatan IV

Miners and mining knowledge in the early modern period were highly mobile. Europe's regional development and overseas expansion created a demand for skilled labor forces. Individuals moved across geographical and cultural boundaries for mining operations not only within Europe, but also to Asia and the Americas. The interest in exploiting subterranean resources also boosted writings about mining and their circulation. Central to this mobility of labor and knowledge was the value placed upon the practitioners' expertise. Expertise in mining and metallurgy was sought after by princely rulers, civil officials, and company directors. Practitioners evoked

their expertise to secure patronage and gain credibility, sometimes even when they lacked the actual one. They also resorted to prior experience when venturing into foreign territories. But could expertise lead mining projects astray? How did practitioners fashion their expertise in a period when mining knowledge was coveted? This panel examines the complexities in the construction and negotiation of expertise in the world of early modern mining. Scholarship has underscored traveling actors' expertise in facilitating technological innovations and the transmission of natural knowledge. Yet this panel also attends to the frictions in the production and transfer of mining knowledge posed by the obstinacy of expertise, especially amid the encounters between different cultures, languages, and belief systems. Often practitioners had to grapple with the limitations of their expertise when confronted with unfamiliar environments. The Europeans' belief in and reliance on their expertise could also give rise to clashes with indigenous knowledge and customs, leading to fraught outcomes. Through comparative case studies on mining knowledge and practices from different regions, this panel brings to light the ways in which European practitioners navigated the challenges and opportunities presented by their mobility, and rethinks the category of expertise in both historical and epistemological terms.

Participants:

Mining the Earth, Roaming the Globe: German-speaking Miners in Europe and Spanish America ***Gabriele Marcon, The Harvard University Center for Italian Renaissance Studies***

In the early modern period, the movement of skilled labor played a crucial role in the development of local economies. In extractive industries like mining, highly skilled practitioners from productive enterprises employed a diverse range of economic, legal, and ecological practices. These strategies were imposed on and adapted to local contexts at various levels. But what motivated these specialized workers to relocate to unfamiliar worksites across the early modern world? And how did the interaction of different groups of knowers shape discourses on mineral resources? This paper aims to address these questions by examining the migration of German-speaking miners across European and Spanish colonial mines in the period 1500-1800. Due to their expertise in mining and metallurgy, German-speaking miners – those identified with the use of the German language or one of its dialects – moved widely across the early modern world. By outlining the preliminary stages of an ongoing project based at the University of Vienna, this contribution explores how male and female miners designed claims of scientific expertise within highly hierarchical labor structures and practices. In doing so, it shows that expert mobility not only reinforced but also shaped definitions of scientific knowledge in early modern mines.

Between Central Europe and West Sumatra: Ores, Mining, and Geological Imaginations ***Wenrui Zhao, Cornell University***

In the late seventeenth century, the Dutch East India Company (VOC) embarked on intensive mining activities along the west coast of Sumatra. Confronting a lack of mining expertise in the Netherlands, the VOC turned to mining professionals from the German-speaking lands, bringing them to the East Indies. These miners transposed their expertise and knowledge of the central European mines onto the foreign terrain, with occasionally fruitful, yet often fraught outcomes. This paper places the ores extracted from the Sumatran mines as the focal point of this historic episode, to explore the interaction between European frameworks of knowing and indigenous knowledge, as well as the global circulation of information and imaginations regarding the earth. Ore specimens from Sumatra were sent to experts in both Batavia and Europe for chemical analysis. Barrels of ores were shipped to the German lands for smelting and refining. In the Netherlands, they were also auctioned at open markets and acquired by amateurs. Between Europe and Sumatra, the trajectory of these ores interwove different types of expertise, shaped distinct geological imaginations, and influenced financial and political decisions.

Viewing Mining Knowledge through the Lens of Alchemy in Early Modern England ***Jennifer Rampling, Princeton University***

The English cosmographer and alchemist Richard Eden (c. 1520–1576) never went to America, but he had plenty to say about the continent's mineral prospects. Eden is now best known for translating cosmographical and metallurgical treatises into English, including Peter Martyr's Decades of the New World (1555) and Biringuccio's Pirotechnia. Yet Eden's original field of expertise was neither cosmography nor mining, but alchemy. Over the space of decades, Eden strove to establish a career in his preferred area of alchemical and medical distillation, only to be confounded by political and legal obstacles at every turn. Eden

did not relinquish this expertise, but rather adapted it to serve a new role in translating the Americas: from observational practices honed by working through chemical operations, to reading techniques developed while parsing obscure alchemical texts. This paper draws on recently-discovered manuscript materials, including recipes, translations, and marginal annotations, to show how Eden repurposed his alchemical knowledge in new ways—in the process, advancing English knowledge of the Americas, especially with regard to seeking and mining gold.

Session Organizers:

Wenrui Zhao, Cornell University

Gabriele Marcon, The Harvard University Center for Italian Renaissance Studies

Chair:

Pamela H. Smith, Columbia University

027. Beyond Reductionism: from Dirty Past to Complex Future(s)

Organized Session

4:00 to 5:30 pm, Thursday 7 Nov.

Fiesta Americana: 1st Floor - Izamal I

Over the past few decades, physics has undergone a major reconfiguration and change of perspective, revealing often overlooked aspects of its evolution. While traditionally championed for its reductionist approach, striving to explain complex phenomena by breaking them down into simpler elements, the discipline's trajectory has indeed revealed a reversal of this trend, shifting from a focus on simplicity to an emphasis on complexity. In this direction, condensed matter physics, once relegated as "dirty" compared to the “pure” science ideal embodied by nuclear and particle physics, has notably established itself as the leading proponent of non-reductionist approaches. Its emphasis on the study of emergent phenomena has even proved particularly conducive to understanding the profound complexity of the higher levels of reality. Meanwhile, the new non-reductionist paradigm has even extended to high-energy physics, as witnessed by the widespread use of effective field theories. Nevertheless, while philosophers of science have closely examined many of the implications of this shift, historical research has lagged behind. This panel aims to fill this gap by shedding new light on non-reductionist dynamics at the intersections of condensed matter, particle physics, and gravitational physics.

Participants:

Impurities, Defects, Segregation, Emancipations, and Collective Freedom: Towards the Social History of Semiconductors
Alexei Kojevnikov, University of British Columbia

Systems with great many strongly interacting particles – such as solids, liquids, and plasmas in physics – produce emerging effects with various states of freedom, captivity, or subordination between constituents of different kinds. The complexity of situations and power relations in densely packed bodies made the problems of their scientific understanding and mathematical description almost as difficult as sorting out social hierarchies and states of freedom in the world of humans. At least, physicists’ social worldviews and existential life experiences in real societies often guided their intuitions about the collective behavior of atoms, electrons, and ions. The middle decades of the twentieth century – when the quantum physics of condensed matter developed – were also characterized by intense ideological and political conflicts between transforming regimes of freedom and oppression, including Jim Crow America with the growing movement against racial segregation, Weimar and Nazi Germany, Stalinist and de-Stalinized Soviet Union. These contrasting social realities inspired competing approaches, non-trivial metaphors and hypotheses about how much, and what kind of freedom or non-freedom could be assumed for microscopic particles in dense agglomerations, which led to the formulation of some of the most fundamental concepts and inventions that have since defined the contemporary study of condensed material systems.

From the Hierarchy to the “Seamless Web” of Science: Historical Implications of Non-Reductionism in Solid State Physics
Nuria Muñoz-Garganté, Max Planck Institute for the History of Science

Reductionist ontologies claiming to unveil the elemental structure of our material world hold a privileged position that often extends beyond ontology, impacting epistemic and institutional relations across the sciences and influencing power dynamics in knowledge production and resource allocation. This privileged status was evident in the dominance of nuclear and particle physics post-World War II, overshadowing other major research fields like solid state physics (later known as condensed matter physics). In response, the non-reductionist stance adopted by solid state physicists, notably exemplified by Philip Anderson, author of the influential manifesto "More Is Different" (1972), were not mere

innocent ontological claims, but aimed at reverting the prevailing status asymmetry. This talk will explore how Anderson's non-reductionist approach transcended mere conceptualizations of matter. Examining Anderson's contributions from a historical perspective reveals a correspondence between his understanding of the structure of matter and his views on the structure of the sciences. By leveraging physical concepts like "symmetry breaking" in the early 1970s, Anderson advocated for a hierarchical model of the sciences that preserved each discipline's intellectual autonomy, resisting subjugation to particle physics dominance. His subsequent involvement with the emerging field of "complexity" in the 1980s influenced a shift in his model of the sciences, from the linear hierarchy to a network model that mimicked the interacting systems studied in the complex sciences and that he called the "seamless web." Through these evolutions, non-reductionist approaches to matter were put to the service of establishing a structure of the sciences where condensed matter physics could play a central role in the production and advancement of knowledge.

Historical Considerations on Post-Newtonian Expansions: A Non-reductionist Approach to General Relativity? ***Jean-Philippe Martinez, Max Planck Institute for Gravitational Physics (Albert Einstein Institute)***

In recent decades, effective field theories (EFTs) have established themselves as indispensable tools in quantum physics. In this context, in line with Philip W. Anderson's 1972 critique of the entrenched reductionist stance of nuclear and particle physics, they have also become an increasingly important subject for debates on reductionism and emergence. Indeed, as a type of approximation that limits itself to the appropriate degrees of freedom to describe physical phenomena at a chosen scale or energy scale, EFTs underscore the autonomy of different levels of organization, whose inter-relations can be studied. Expanding beyond quantum realms, these approaches have even found their way into general relativity. Initially applied to problems linked to the search for a quantum theory of gravity, EFTs have more recently played a decisive role in post-Newtonian expansions. Used to find an approximate solution to Einstein's field equations, they gradually led to the establishment of a complex tower of theories of gravity, each valid on different scales. These advances then underline a profound question: can general relativity also be seen as an embodiment of the non-reductionist essence of science? I propose exploring this question through a historical lens, drawing on Vladimir Fock's early contributions to post-Newtonian approximations in the late 1930s. In particular, we will see how his approach to theoretical physics, imbued with the Marxist philosophy of dialectical materialism, actually prefigured, through its anti-reductionism, the basic principles of EFTs. We will then look at how subsequent developments in general relativity, inspired by the methods of quantum physics, gradually developed essential non-reductionist features.

Session Organizers:
Nuria Muñoz-Garganté, Max Planck Institute for the History of Science
Jean-Philippe Martinez, Max Planck Institute for Gravitational Physics (Albert Einstein Institute)

Chair:
Joseph D. Martin, Durham University

Commentator:
Joseph D. Martin, Durham University

028. Representations of Health, Disease and Bodies in the Middle East (C19th-C20th)

Organized Session
4:00 to 5:30 pm, Thursday 7 Nov.
Fiesta Americana: 1st Floor - Izamal II

The history of medicine and science in the modern Middle East is closely connected within the history of colonialism in the region. From the late nineteenth century, colonial doctors sought to define the terms of modern medical practice, establish legal and scientific borders in practice and administration, and shape ideas about disease and its prevention. At the same time, doctors, scientists and other local practitioners both engaged with and pushed back against the colonial regimes of biomedicine, offering new approaches and ways of knowing the body and health. This panel explores this history through Ottoman, Egyptian and Iraqi histories of health, disease and bodies. In doing so, it shows how health and medicine functioned as key sites of contention and negotiation between colonial and local administrations, how scientists shaped regional and international debates about these practices, and the legacy of these contestations in the states that followed. The four papers in the panel offer a range of approaches to these subjects, drawing on medical photography, scientific journals, and colonial and national archives to draw out the experiences of doctors, patients and scientists, while paying particular attention to the experiences of practitioners and patients often

obscured in the archival record. Through this, the panel aims to open up conversations about the Middle East in the global history of medicine, the politics of biomedicine and public health, and new methods in the study of health and disease.

Participants:

Photography's Application to Medicine in Colonial Egypt *Tamara Maatouk*

This paper addresses the photograph as a historical source to explore unmapped territories in histories of medicine and photography in nineteenth- and early-twentieth-century Egypt. First, it examines how the application of photography to medicine emerged in Egypt, who practiced it and why, what criteria governed the selection of photographs in scientific and medical publications, and what functions they performed or were intended to serve. As such, it demonstrates how medical photography in Egypt developed along broader global practices in photography, printing, and modern medicine. Second, this paper asks what stories these photographs can and may tell us about the practice of modern medicine in a colonial context that written texts cannot or do not. A juxtaposition in colonial doctors' selection of photographs with that of Arabic scientific periodicals reveals many similarities between local and colonial use of medical photographs but one clear distinction, namely the use of photographs on the part of local medical practitioners as pictures of health, defined by anthropologist Zeynep Devrim Gürsel not as "images of pathology but photographs that visualize successful medical care."

Disease, Hygiene, and Politics in Hashemite Iraq *Rebecca Irvine, Graduate Center, CUNY*

This paper examines political and intellectual debates around disease and hygiene in Iraq, through the later years of the old regime under the Hashemite monarchy (1930-58). These debates focused on questions around health and medicine, particularly with regard to the rural provinces of the country and the high levels of endemic diseases in these regions. Such questions were widely addressed both by government officials in state and local administrative documents, as well as more broadly in newspapers, literary magazines and scientific pamphlets. In tracing the trajectory of these debates – and their interrelation – I show how discourses of ignorance and social degeneracy were often called on to explain levels of ill health and disease in rural areas, and established the provinces as a burden on the nation. At the same time, the relationship between the population, the land and water formed a central part of the emerging discourse, identifying the environment of the provinces as a potential opportunity. These ideas underpinned efforts to expand limited the curative and preventative health apparatus in Iraq during this period, shaping the particular emphasis on environmental management and remaking the landscape. Finally, I conclude with reflections on the legacy and persistent influence of images of rural Iraq as a problem to solve even after the fall of the monarchy.

Establishing a Medico-Legal Border in British Mandate Iraq *Bret Windhauser*

When the British Empire commenced the Mesopotamian Campaign of World War I, British medical officers quickly denounced Ottoman quarantine practices. The subsequent British medical administration in Iraq gradually moved quarantine stations from their Ottoman-era locations outside large cities and along trade routes to border towns and ports of entry. This paper argues the British reformulation of quarantine geographies to border sites in Iraq and new training techniques proved ineffective at responding to epidemics within the country and led to situations of spreading disease through people departing Iraq. Whereas Ottoman officials built quarantines to stop epidemics from entering cities and trade corridors, the British focused on detaining pathogens and the bodies carrying them from entering the country at all. The creation of this medico-legal border pushed medical practitioners to towns such as Khanaqin, Mandali, and Zubair. This paper also investigates British quarantine stations' staff along the Iraqi borders, analyzing how male and female medical practitioners interacted with living and nonliving bodies. I conclude with the 1919 influenza epidemic in India which can be traced to British quarantine failures in southern Iraq.

Between Empires and Epidemics: Ottoman Doctors and the Global Circulation of Medical Knowledge in the 19th Century *Hratch Kestenian*

This study reevaluates the transformative role of Ottoman-Armenian doctors in the 19th-century Mediterranean and Eurasian medical landscapes, challenging prevailing narratives of Western dominance in biomedicine. Utilizing a methodological blend of

archival research and analysis of scientific journals such as Gazette Medical D'Orient, it illuminates a dynamic network of knowledge exchange that spanned from Paris to Istanbul, St. Petersburg, and Alexandria. This approach maps the geographical breadth of Ottoman-Armenian medical influence and underscores the depth of their contributions to medical knowledge and public health discourse. By documenting how Ottoman physicians actively engaged in global discussions on public health, domesticity, and national well-being, the study reveals the significant role these individuals played in the professionalization of medicine within Ottoman and Armenian communities. It highlights the publication of scientific journals as pivotal platforms for shaping a health-conscious public discourse, aiming to regulate daily life through scientific and biomedical means. The paper concludes by emphasizing the broader implications of this research for both Ottoman Studies and the global history of medicine. It showcases the Ottoman-Armenian medical professionals not as isolated figures but as integral participants in the global exchange of medical knowledge. This work enriches our understanding of the interconnected history of medical science, illustrating the complex interplay between nationalism, professionalization, and healthcare that transcended geographical and cultural boundaries. In doing so, the study contributes valuable insights into the role of Ottoman-Armenian doctors in 19th-century medical transformations. It offers a fresh perspective on the circulation and translation of medical knowledge across cultural and geographical divides.

Session Organizer:
Rebecca Irvine, Graduate Center, CUNY

Chair:
Beth Baron

Commentator:
Laura Frances Goffman, University of Illinois Urbana-Champaign

029. Cold Science

Organized Session
4:00 to 5:30 pm, Thursday 7 Nov.
Holiday Inn: Lobby Level - Maya

In early 2024, a Greenlandic startup announced the official start of its business operations: fishing icebergs broken off ancient glaciers out of Greenland's fjords and shipping them to Dubai for luxury cocktail consumption. Online commenters have condemned the startup's crass disregard for twenty-first century concerns, which revolve more than ever around the precariousness of cold in times of climate change caused by human patterns of consumption. The startup's controversy brings cold into high relief as a feature that unites contexts distant in space and time. Cold conjures up visions of interconnected pasts, presents, and futures, while also highlighting differences between places that have too much of it and places that don't have enough. This panel brings together new research into the history of cold that explores how scientists working with freezing phenomena crafted consciousness of cold contexts operating at different temporal and spatial scales. Spanning three centuries and three continents, the papers in this panel cover investigations into various types of cold, from the technoscience of refrigeration to freezing brought about by meteorological and climatic conditions. Starting in the seventeenth century, the first paper analyzes how travelers' descriptions of Persian refrigeration technologies fed into a growing European interest in the science and technology of freezing. The second paper addresses how scientists in eighteenth-century Europe compiled memories of extreme winters past in a qualitative approach to the development of risk mitigation strategies for future cold spells. The third paper shows how the craze for frozen mammoth remains in early twentieth-century North America inspired analogies between industrial freezing technology and the circumpolar Arctic region. Together, the papers investigate how freezing has engendered diachronic and global environmental awareness across the longue durée history of cold science.

Participants:

Persian Freezing Technology and the Science of Cold in Seventeenth-Century Europe ***Anna Speyart, Princeton University***

In the seventeenth century, European travelers frequently remarked on refrigeration practices observed on their journeys through Persia. In their published travel accounts, Piero Della Valle, Jean Chardin, and Adam Olearius all described how Persian communities harvested, stored, transported, and consumed ice and snow around the year. Travelers were in awe of the freezing ditches, ice houses, and shade walls with which Persians harnessed temperature differences for their comfort. These detailed descriptions of Persian freezing infrastructure reflected a growing interest in freezing developments closer to home: a taste for iced drinks was rapidly gaining ground across early modern Europe. Using the features of their local landscape and climate,

consumers from Seville to Stockholm revived the ancient practice of storing winter's ice or snow for summer chill. These changing patterns of consumption sparked a wave of scientific research into the nature and effects of cold. Natural philosophers like Robert Boyle read travel writings to distill information about cold phenomena in different climates. This paper traces how travelers' descriptions of Persian freezing technology contributed to early modern cold science by allowing for comparative reflections on climate and refrigeration practices.

Cold Chronologies and the Limits of the Quantifying Spirit in the 18th century ***Jin-Woo Choi, Princeton University***

The temporalities and topographies of cold were of key interest to Enlightenment naturalists at a time when classical notions of static, latitudinal 'climes' were increasingly supplanted by fluid regimes of annual climatic variability. Winter returned every year, but each year its intensity was unpredictable. A series of extraordinary frosts from the late seventeenth to the mid eighteenth centuries prompted investigations across Europe into the written and material vestiges of great winters past. These histories of cold were oftentimes exercises of intellectual curiosity and erudition, but some were also practical projects aspiring to mitigate losses of plant, animal and human life in future cold spells inevitably to come. Retrospection became just as important as exploration. This presentation looks to authors in the 1780s commenting on those in the aftermath of the frost of 1740, who compared their plight with testimonies about the frost of 1709. In all three instances, commentators looked backwards in systematic ways to orientate their contemporary experience. In the process, they came to question the usefulness of thermometers and other instruments of the new science, especially in seeking patterns that ran deeper in time. The construction of cold chronologies thus complicates the traditional picture of Enlightenment meteorology as one indubitably driven by a 'quantifying spirit.'

"A Vast Natural Refrigerator": Frozen Mammoths, the Technoscience of Cold, and the Arctic in the Early 20th Century ***Rebecca Woods, University of Toronto***

At the turn of the 20th century, an enthusiasm for collecting frozen mammoth remains from Alaska and the Yukon seized the American Museum of Natural History. Although a sequence of expeditions in 1907 and 1908 were largely unsuccessful (only very small fragments of flesh and hide were ultimately collected), this spurt of activity provided an occasion for naturalists, collectors, and paleontologists to reflect on the nature of frozen ground in the North American Arctic. In an earlier moment, the mid 19 th century, discourse on novel technoscientific applications of "artificial" cold drew parallels between meat frozen and chilled by steam-powered refrigerators, and the preserved carcass of the Adams mammoth, unearthed from Siberia in 1806. 20 th -century commentary extended this analogy to the Arctic region itself. Experts at the AMNH and elsewhere described the northern-most reaches of North America as a "vast natural refrigerator" and "nature's own ice house." Drawing on published scientific articles, the archives of AMNH expeditions, and popular writing about cold, refrigeration, and frozen mammoths, this presentation will explore the implications of such far-reaching analogies for understanding the technoscience of cold and the circumpolar Arctic alike.

Session Organizer:
Anna Speyart, Princeton University

Chair:
Elaine Leong, University College London

030. Botanical Knowledge from New Spain to the World

Organized Session
4:00 to 5:30 pm, Thursday 7 Nov.
Fiesta Americana: Lobby Level - Salon Celestun

Mexico has long been known for its rich flora, which has attracted worldwide commercial, scholarly, and amateur interest for centuries. Likewise, its well-documented indigenous plant use traditions – some of which have been recorded in writing since the sixteenth century – have made it an area of particular interest for anthropological and ethnobotanical investigation. Taking advantage of this deep multicultural history, this interdisciplinary panel will discuss botanical knowledge in New Spain from the viceroyalty's 16th-century foundation to its end, focusing on the interface between indigenous plant-related knowledge and other botanical systems.

Participants:

"…My Late Ingenious Friend Dr. William Houstoun" – An Opening of the Modern Era of Mexican Botany ***Edelmira Linares, Jardín Botánico, Universidad Nacional Autónoma de México; Robert Bye, Universidad Nacional Autónoma de México***

Knowledge of the botanical treasures of New

Spain for the first two centuries was based on the field work and compilations of Francisco Hernandez (1517-1587; court physician to Philip II of Spain). As the European plant sciences moved into the Modern Era/Age of Enlightenment, Mexican plants found in contemporary taxonomic and floristic publications (p. ej., Hortus Cliffortianus and Species Plantarum by Carl Linnaeus and The Gardener's Dictionary of Philip Miller) were based on Hernandez's Rerum medicarum and those grown in private gardens. The first scientific specimens derived from New Spain were obtained by Dr. William Houstoun (1695-1733). Even though he was confined on-board a British ship by Spanish authorities, he was able to obtain herbarium specimens and propagation material of important plants from Veracruz and Campeche which he analyzed (Reliquiae Houstoniae) and Linnaeus and Miller published. Using data derived from these specimens and publications, Houstoun's impact on the awakening modern era of botanical science (such as the Spanish Enlightenment's Real Expedición Botánica a Nueva España (1787 – 1803) as well as the first authorized foreign expedition by the Spanish crown, that of Humboldt and Bonpland (1799-1804)) is analyzed. Taken into consideration are Mexican plants that became globally important as food (tomato, avocado, chaya), flavoring (vanilla), medicine (tobacco, jimsonweed), commerce (logwood), and ornamentals (bluemint, hierba de San Juan).

The Plants of Book 11 of the Florentine Codex (Presentado en español) ***Salvador Reyes Equiguas, Instituto de Investigaciones Bibliográficas, Universidad Nacional Autónoma de México***

This presentation will provide a general overview of the system under which plants appear in Book 11 of the Florentine Codex on the basis of the Náhuatl text, as well as some comparisons with the corresponding passages in Spanish. It will argue that the ordering of the chapters follows a hierarchical presentation of plant life-forms as understood under the Nahua cosmovision, as well as noting the potential influence of Spanish Renaissance thought on the text's authors. It will also explore other aspects related to Nahua understandings of plant classification and nomenclature.

Cultivating Salvation: Religious Gardens and Botanical Knowledge in Early Colonial New Spain ***Marlis Hinckley, Johns Hopkins University***

Beginning with the arrival of the first missionaries in New Spain in the 1520s, religious figures would play a key role in the intellectual life of the new colony. By the turn of the 17th century, the ranks of the religious included not only friars and priests, but also nuns, all of whom engaged with plants in the course of their religious duties. Frequently, they took advantage of locally available plants and botanical knowledge to make their own gardens, which provided them with food, medicine, and spiritual benefits while also serving as a space to learn about novel plants. At the same time, their religious convictions placed strict limits on the permissible uses of plants, particularly those associated with pre-Hispanic religion. This paper will examine plant cultivation in the early 17th century at religious houses in central Mexico, discussing how this Christian context helped shape the spread of American plants and plant-related knowledge.

Session Organizer:
Marlis Hinckley, Johns Hopkins University

Chair:
Marlis Hinckley, Johns Hopkins University

Commentator:
Francisco Vergara Silva, Universidad Nacional Autónoma de México

031. Rethinking Scientific Figures

Contributed Paper Session
4:00 to 5:30 pm, Thursday 7 Nov.
Holiday Inn: Lobby Level - San Jacinto

Participants:

Bertrand Russell's Equilibrium Theory of Human Evolution ***Zachary Seth Hamby, Indiana University***

Bertrand Russell developed a long history of human behavior based on evolutionary mismatches. His "equilibrium theory," introduced only in his 1924 pamphlet Icarus, declared that both animals and humans could outpace their environment and retain behaviors that no longer made sense. Wolves, for instance, took every opportunity to hunt and eat while in the wild, since prey was typically scarce. After dogs were domesticated, they entered a new environment in which their caretakers could provide endless food on demand, but the dogs retained their desire to overeat and subsequently developed health and behavioral issues. A similar discrepancy affects humanity. Early peoples benefitted from rivalry and competition, claimed Russell, but in

the wake of the Great War, it threatened to tear the world apart. Russell's equilibrium theory provides a fascinating insight into the interwar eugenics movement. Russell wrote in To-Day and To-Morrow, a semi-utopian, multi-authored, decade-long (from 1924 to 1932) collaborative series where scientists, philosophers, and social commentators speculated on mankind's place in the scientific future. Often uncomfortable with the scientific and/or political consensus on eugenics, I argue that progressives used the series as a springboard for developing counter-eugenical ideas. Russell's mismatch theory demonstrated a holistic view of humanity that attempts to remedy our self-destructive behavior through education and social programs.

"Rigorous Cultivation of Memory": Nikola Tesla between Yugoslavia and American Science Fiction ***Ivan Flis, University of Rijeka***

"Tesla is better known than others [AC motor inventors]," writes Thomas P. Hughes in his Networks of Power, "not only because of the success of his invention but also because his native country, Yugoslavia, has rigorously cultivated his memory […]." What a strange thing to write when we consider that at the time of Nikola Tesla's birth in 1856, Yugoslavia was decidedly not a country, but an intellectual fad, a panslavist idea percolating through the unstable frontier between the Austrian and Ottoman empires. Tesla was born in Lika, in the Austrian Military Frontier, but, at the time when Hughes wrote his book, this region could have only one designation in the mind of an American historian: Tito's Yugoslavia. Yugoslav communists invested considerable effort in commemorating Tesla after his death; they retrieved his nachlass from the Americans, opened a Tesla museum in Belgrade (1952), lobbied internationally to name the SI unit of magnetic flux a Tesla (1960), financed a biopic, and organized multiple international commemorations. In this talk, I will focus on a particular vehicle of this commemoration from 1977 – Tesla's autobiography that was published by Školska knjiga in Zagreb – by compiling six texts Tesla published about his life in the New York hobbyist magazine Electrical Experimenter in 1919. Hughes was partly right. Tesla as a pop cultural icon had a much more entangled history, meshing American pulpy mid-century science fiction, Yugoslav state commemoration, and the ambition of one American publisher to build Tesla "a textual monument" for the future.

Controlling Systems and Controlling Legacies: Barbara McClintock's 1961 Conversation with Two Bacterial Geneticists ***Qinyan Wu, University of Pennsylvania***

The American maize geneticist Barbara McClintock (1902 –1992) was awarded the 1983 Nobel Prize "for her discovery of mobile genetic elements." However, as Nathaniel Comfort points out, McClintock took her key contribution as the explanation of maize control systems, rather than the discovery of mobile elements. I examine a crucial episode where McClintock tried to control the interpretation of her work by paralleling her research to that of two bacterial geneticists, François Jacob and Jacques Monod. Nevertheless, Jacob and Monod rejected McClintock's parallels and insisted that her contribution was limited to mobile elements. Upon examining their published papers, I propose that it was Jacob and Monod who misunderstood McClintock. While overt sexism was not expressed, I argue that the rapid dismissal of her argument by two prominent men in genetics resonates with many other cases of gendered bias at the time, namely the Matilda Effect, as documented in Margaret Rossiter's influential account of women scientists in the 20th century. I further apply the concept of "a gender neutral science" proposed by Evelyn Fox Keller to investigate the reasons behind the long-lasting under-recognition of McClintock's key contribution, both reinforced by the two male bacterial geneticists, and ironically, by the award of the Nobel Prize itself.

"Debating Einstein: The Einstein Papers Project and Disputes about Scientific Authority during a Crisis of Expertise, 1970-1989" ***William Krause, Vanderbilt University***

This essay examines the "Einstein Papers Project," an endeavor led by Princeton University Press to collect and store the papers of theoretical physicist Albert Einstein during the 1970s. It places the efforts of major figures in the history of science and physics – including John Wheeler, John Stachel, and Martin Klein – into context by revealing the extent to which public discourse about the "truth" of Einstein animated the anxious attempt to secure the physicist's legacy in the form of an archival collection. In "Debating Einstein," I argue that professional and public disagreements over Einstein's contributions were also disputes about the proper role of scientific authority in a modern, democratic society like the US. These

debates contributed to a crisis of expertise that became increasingly fraught during the 1970s. This paper derives from my research on debates about “genius” in the modern United States, which I am conducting under the mentorship of Sarah Igo and Laura Stark. Archives from the American Philosophical Society form the primary source foundation of the chapter, and this research was supported by a Short-Term Research Fellowship from the APS. By investigating debates about Einstein’s “imperfect past,” this paper makes several contributions to the history and historiography of science. First, it broadens the scope of actors in philosophical discourse, excavating the role of previously-neglected labor in professional efforts to articulate and understand Einstein’s role in the twentieth-century physics. Further, this paper uses contemporary methods from feminist Science and Technology Studies scholars to deepen our understanding of the early history of science and its role in the “crisis of expertise” that reached new heights by the 1970s. For historians sensitive to the feedback loops between professional science and public epistemologies, debates about Einstein are not over-trodden terrain, but rather a rich archive that can give us special insight into late modern American life.

Chair:

Ku-ming (Kevin) Chang, Academica Sinica

032. Plants and Power: Unearthing Authority and Control in the History of Botany II

Organized Session

4:00 to 5:30 pm, Thursday 7 Nov.

Holiday Inn: Lobby Level - Santiago

[Part II of Double Session] While historical and sociological reflections of biology have long been characterized by a bias towards the animal kingdom and largely neglected the intricate history of plant biology, the last years have been marked by a vegetal turn across the humanities. But still, the history of botany remains most widely an underdeveloped field today. In this double sessions, we want to explore the complex history of botany through the lens of power structures that shaped and still shape botanical institutions and practices. Possibly, more than any other biological field, botany strongly depended on and was influenced by asymmetrical power relations, colonial entanglements and the exploitation of various social and ethnic groups, including of indigenous knowledge. In the session, we want to identify centers of power and explore the various roles marginalized groups in Latin America and (South East) Asia played in producing botanical knowledge during the mid-19th to mid- 20th centuries. First, by following the traces of individual plant collectors like Percy H. Gentle, Margery Carlson and Ynés Mexía (Baedke’s, Straetmanns’ and Gianquitto’s papers), this session unearths their often uncredited contributions to the buildup of botanical knowledge and collections and sheds light especially on the role of women and local collectors in colonial practices of botany. Second, the session focuses on the intersection of Western scientific systems and indigenous knowledge about plants (Goss’, Uchôa´s and Smocovitis’ papers). This includes efforts to validate indigenous plant-based medicinal practices within a Western scientific framework in late-colonial and post-colonial Indonesia; the relation between the concept of “savage knowledge” and the emergence of the field of ethnobotany in the Amazon region; and questions about ownership, nationalism, and the exploitation of natural resources, underlying the US "Cinchona Missions" in Latin America. In sum, this session aims to uncover social, political, and economic hierarchies and power relations that constituted the production of botanical knowledge from the late 19th to mid-20th century. In this context, it also explores new digital approaches to identify and make visible forgotten actors in the history of botany.

Participants:

The Science of Indigenous Medicinal Plants in Late-Colonial and Post-Colonial Indonesia
Andrew Goss

Western botanists long have been interested in the tropical nature and society of Indonesia. They imposed European scientific systems over all knowledge gathered, partially out of chauvinism, and partially to bolster the perception of their validity within Western science. As the field grew over time, a subset of those Westerners gathering knowledge in Indonesia found value in indigenous wisdom and began to insert that data into the official records, usually without crediting the local people who gave them that information. In the 1920s and 1930s, this began to manifest itself in efforts to scientifically catalog and describe plants from the colony that Indonesian tradition suggested had healing properties. By the 1930s this led to efforts by physicians at the medical school in Jakarta (Batavia), to show the efficacy of obat asli (indigenous medicine), through scientific means. These efforts expanded during the Japanese occupation, as Japanese and Indonesian researchers sought to systematically establish which indigenous medicines had therapeutic value. In the context

of anti-colonial politics, new efforts were underway to devise a modern Indonesian scientific and public health culture based upon indigenous resources. This continued during the Indonesian Revolution, and became a feature of early Indonesian scientific and medical culture. It relied on Western scientific methods, but focused on the plants and remedies of the Indonesian nation. This effort culminated in the Indonesian proposal to hold a UNESCO symposium about medicinal plants, which originally was to be in Indonesia, but ended up being part of the 1953 Pacific Science Congress. This paper concludes by showing how these efforts at showing the value of Indonesian nature remained influential within Indonesian science.

Repatriating an "American" Plant: The US "Cinchona Missions" in Latin America (1942-1945) ***Vassiliki Betty Smocovitis***

This paper explores US-American botanists' efforts to collect, transport and purify cinchona bark, the source of quinine, the famed anti-malarial agent, during the second world war after the traditional supplier, the Javanese-based Banfoengsche Kininefabriek, fell to Japanese military control. Under the auspices of the Board of Economic Warfare, a US government wartime agency in charge of strategic materials, over twenty US-American systematic botanists from a range of traditional universities, gardens and research centers recognized as centers of botanical study were sent to a diverse range of Andean habitats in search of the originary or "wild" stands of cinchona especially rich in the plant alkaloid. In addition to "procurement," these botanists were also instructed by the Board to facilitate "development plans," and "training plans," that would alleviate dependency on foreign sources of quinine, permanently. Part of what came to be called the "Cinchona Missions" involved formal agreements with most of the principal suppliers of cinchona bark in Latin America, and included collaboration between US botanists and local developers interested in building plantation industries that included pharmaceutical companies like Merck and Co. that were already present in countries like Guatemala. The paper will focus on the US botanists' vision of this work, and the identification—and ownership—of this tree, against the complex interplay of US involvement in Latin America, local developers, and Indigenous or local knowledge. Perceived as an "American" plant, US botanists in part saw their mission in nationalistic terms, and viewed their exploratory efforts in the Andes as part of a repatriation effort for a tree that had been smuggled, indeed stolen, and uprooted from American soil in the 19th century when it was taken to Java. Keen on building the scientific discipline of "economic botany," furthermore, US botanists' saw their efforts in terms of an emerging global perspective, one that served international scientific interests that included Latin America; the reality was, however, that the "Cinchona Missions" served mostly the scientific and economic interests of a growing US-American empire, one that saw all plants in the western hemisphere as under US-American ownership.

Margins and Networks: Mapping Ynes Mexia's South American Botanical Excursions ***Tina Gianquitto, Colorado School of Mines***

In the early 1930s, Ynés Enriquetta Julietta Mexía (1870-1938), traveled thousands of miles of down the Amazon, collecting plants with the help of local guides, boatmen, and the countless indigenous and other local sources. In numerous diaries, hundreds of letters, and detailed account books, Mexía describes a journey that netted her around 65,000 plants, which she packaged and sent to institutional correspondents and private collectors around the world. Although Mexía turned to plant collecting as a profession later in life, taking her first botanical expedition at the age of 52, she was quickly becoming an important collector of Central and South American plants during her short career. In my talk, I will outline a new collaborative digital project that uses materials from Mexía's archive to create an interactive digital archive of her journey through South America. Using frameworks for digital projects from citizen environmental humanities, our interdisciplinary team invites conversations on how the mapping of networks—of correspondence, of influence, of participation—can help us render the multiple locations of women's intellectual production. It can also help us reconsider ideas of center and periphery and, perhaps most importantly, provide ways of thinking about archival presences and silences. The project thus seeks to reconnect the plants that Mexía took out of the Amazon with the indigenous people and practices in which those plants participated.

Session Organizers:

Jan Baedke, Ruhr-University Bochum
Vera Maximilia Straetmanns, Ruhr-University

Bochum
Vassiliki Betty Smocovitis

Chair:
Donald L. Opitz, DePaul University

033. Plastic Temporalities: Ecologies of Disposability in Science and Medicine

"Futures" Roundtables
4:00 to 5:30 pm, Thursday 7 Nov.
Fiesta Americana: Lobby Level - Yucatan II

Quietly, in the late 20th century, plastics replaced glassware as the dominant substrate of scientific and medical practice. To the scientific virtues shared with glass (transparency, inertness, sterilizability), plastics added new qualities (economy, ductility, and disposability). But the long-term health costs of plastic's temporal range—stretching back to the limits of the Carboniferous to an indefinite future, from the brevity of the single-use to the longevity of nonbiodegradable landfills, airborne dioxins, seaborne waste-islands, and omnipresent microplastics--require new reckoning in relation to contemporary sciences of planetary health. This roundtable assembles historians and anthropologists of science, medicine, and temporality to explore the material histories of plastic infrastructures in laboratories, hospitals, and clinics across different geographies (from Baltimore to Oslo to Dar-es-Salaam) and the role of historical research in shaping more sustainable futures for scientific and medical practice. Panelists draw from their current research on the material histories of common objects which have been rendered disposable (petri dishes, pipettes, catheters, syringes, and gloves) and which cumulatively now constitute a bioscientific waste stream that is responsible for nearly 10% of global carbon emissions. These vignettes from the field will frame more general questions on how historians can insert new and necessary kinds of temporal thinking into contemporary policymaking on sustainability in science and medicine. Drawing on a variety of disciplinary positions (ethnography of global clinical trials, local records of institutional purchasing and supplies, oral histories with environmental justice activists, repositories of regulatory and marketing materials), our roundtable will sketch out theory, methods, and broader role for global historians of science in reckoning with the future of scientific and medical wastefulness.

Session Organizer:
Jeremy Greene, Johns Hopkins University

Participants:
Anne Kveim Lie, University of Oslo
Peter Ernest Mangesho, National Institute of Medical Research, Tanzania
Adriana Fraser, University of Pennsylvania
Amana Mahoney, Case Western Reserve University / Dittrick Museum of Medical History
Helge Jordheim, University of Oslo

034. New Directions in the History of Science in South Asia

"Futures" Roundtables
4:00 to 5:30 pm, Thursday 7 Nov.
Fiesta Americana: Lobby Level - Yucatan III

Have South Asia historians cast aside the prior dominant framework of statist and institutional analyses of "colonial science"? What are the encumbrances of the prior framework, and what are opportunities and pitfalls of emerging new directions that revisit colonial difference, but which also mobilize new directions in global and postcolonial/post-colonial histories? As this Futures Round Table looks at current trends and their self-corrective trajectories, it notes how the colonial archives did in fact over-determine the nature of historical narratives in the past. The turn to "vernacular" as sources of information and as a hubris for exploration may have provided a reprieve from prior constraints as more regional and local histories continue to be explored in a decolonizing perspective, but what lies beyond colonial and vernacular? The participants agree that the future of the field must necessarily wrestle with these new challenges: The South Asian historical studies are not immune from the "global turn" and here as scholars embed imperial/colonial structures into currents in global geographies, they must balance the attention to global archives with an equally deft fine-combed analysis of the "area." How would one build engaging conversations across the concerns of global studies and area studies? Histories of science in South Asia are also embracing the attention to post-independence decades in South Asian historiography, using new archives, and drawing upon social scientific theories and their insights from domains of sociology, geography, anthropology, and political science. Can these new directions justify themselves historiographically while also staying true to the mainstream concerns of history of science and its founding themes of constructivism?

Session Organizers:
Sohini Chattopadhyay, Union College
Prakash Kumar, Pennsylvania State University

Participants:
Uponita Mukherjee, Fordham University
Sayori Ghoshal, Krea University
Tara Suri

035. Plants and Empire

Contributed Paper Session
4:00 to 5:30 pm, Thursday 7 Nov.
Fiesta Americana: Lobby Level - Yucatan IV

Participants:

National Health, Local Knowledge: The Medical Origins of Ethnobotany in Mexico (1890-1929) ***Abigail Nieves Delgado, Utrecht University***

Eugene Hunn's influential paper "Ethnobiology in Four Phases" (2007) has become the main framework to understand the development of the discipline. While this framework may be useful to locate general theoretical trends that emerged in the field over time, it does not match the development of local ethnobiological traditions. In this presentation, I want to complexify this framework by looking closely at the development of Mexican ethnobotany at the turn of the 19th century. By exploring the botanical and medical work done at the 'Instituto Médico Nacional' (hereafter IMN) in Mexico City, we come to understand how the utilitarian focus of ethnobotany was driven by domestic human health concerns. Mexican historians have written extensively on the national and international scientific relevance of the IMN. Founded in 1890, the IMN had the purpose of developing a Mexican pharmacopeia based on the study of the rich diversity of indigenous plants. At that time, several plants and animals were used by Mexicans to cure different diseases, but not all of those were effective. One task of the IMN was to separate the plants that work from those that did not, and educate the public accordingly. To collect plants, the IMN sent questionnaires and instructions for collectors who then returned plant specimens and information on their usage. These plants were passed to subsequent commissions for the extraction of active substances and the production of medicines. Finally, the medicines would be tested on patients in medical institutions. Through a focus on the ethnobotanical work at the IMN and its underlying practices (1890-1929), I uncover recurrent motivations and worries among scientists, still relevant today, that are related to the exceptionality of Mexico's natural and cultural richness and the importance of its preservation. More generally, I discuss the role of early ethnobiology in Mexico within a larger scientific and socio-political context.

Loss of Indigenous Knowledge about Aloeswood and the Environmental Consequences of that Loss. ***C Michele Thompson, Southern Connecticut State University***

Aloeswood is produced from trees of the genus Aquilaria in Southeast Asia and southern China. Aloeswood was carried as far as the Mediterranean by the time of the Roman Empire. Aloeswood was demanded as tribute by Chinese rulers from the early Chinese contact with peoples south of the Yangtze. The Chinese received aloeswood primarily from Đại Việt and Champa, but these two states acquired it from minority peoples in their highlands. The fragrant substance from Aquilaria trees is produced when they are infected by a mold and in response the trees sends sap/resin to the affected area imbuing it with scent and making very oily and heavy. Chunks of infected wood are the product known as aloeswood. Aloeswood was a sustainable item of trade for well over a millennia while its harvesting remaining in the hands of minority peoples who possessed the knowledge to determine if a given tree was infected and the wisdom to leave said tree alone until the aloeswood it contained had grown as large as possible. However, recently lowland Vietnamese are cutting down any tree of the correct species on the theory that any such tree may contain aloeswood. This tree poaching is adding to other causes of deforestation. This paper will explore how the loss of indigenous knowledge of many of the historically traded products of Southeast Asia's waters, mountains, and forests is directly contributing to its current environmental crises of deforestation and biodiversity loss through the specific example of aloeswood.

Gathering the World Under Glass: The Enlightenment Greenhouse as Fulcrum of Empire ***Tamara Caulkins***

The study of plants in early modern greenhouses was inextricable from the dynamics of colonialism and economic and social inequality. Since the Renaissance, growing exotic fruits such as oranges and pineapples had been reserved for the wealthy. During the eighteenth century, grand plans for royal greenhouses drawn up by naturalists such as Michel Adanson (1737-1806) for Louis XV and, later, hothouses built for Marie Antoinette, as well as greenhouses located in port cities such as Brest demonstrated the importance of greenhouses as connections to colonial possessions and displays of wealth and influence. They also offered a physical space in which to contemplate a more intimate sense of imperial power and global connections. For Adanson, the first European botanist to research plants in Africa in situ, greenhouses were a key intermediary for

developing a natural system of taxonomy that could accommodate new tropical plants. His daughter, Aglaé, found greenhouses unnecessary. In contrast, her contemporary, Joséphine Bonaparte, negotiated her status as a foreign-born queen of empire through her cultivation of exotic plants in vast heated greenhouses. As a technology, glass hothouses proved instrumental in locating Europe and North America as a centralized metropoles against a plethora of supposedly peripheral places. With new production techniques for manufacturing glass, greenhouses and hothouses continued to play many roles, from defining hardiness and fragility to fostering optimism with regard to controlling climates and peoples. Through the lens of the greenhouse, one finds networks of exchange that illuminate the development of an increasingly diverse and interconnected natural world.

Chair:
Elaine Ayers, Yale University

036. HSS Opening Plenary: Thinking in Centuries: The Past and Future of the History of Science
Plenary Session
6:00 to 7:30 pm, Thursday 7 Nov.
Fiesta Americana: Lobby Level - Yucatan I

This plenary invites its six speakers and the HSS community as a whole to reflect on and celebrate the past century of the History of Science Society while also exploring the possibilities—and pitfalls—for the next hundred years of our field. Panelists will respond to questions about the historiographic, methodological, thematic, and structural changes to the broad field of the history of science over this time period, as well as how the History of Science Society itself responded to these shifts. The speakers will also reflect on the challenges and opportunities for the Society and the field for the coming century: where might the field go from here, and how can the Society best serve our community in a rapidly changing world? Speakers and audience members will collectively consider these imperfect pasts and tense futures.

Presenters:
Helen Anne Curry, Georgia Institute of Technology
Fa-ti Fan, Binghamton University
Pablo F. Gómez, University of Wisconsin–Madison
Elaine Leong, University College London
Projit Bihari Mukharji, University of Pennsylvania
Elly Truitt, University of Pennsylvania

Session Organizer:
Christina Ramos, Washington University in St. Louis

Chair:
Courtney Thompson

037. HSS Opening Reception
HSS Annual Meeting
Reception
7:30 to 9:30 pm, Thursday 7 Nov.
Fiesta Americana: Lobby Level - Montejo Terrace

FRIDAY, NOVEMBER, 8

038. HSS Chair's Breakfast
Breakfast
7:00 to 8:00 am, Friday 8 Nov.
Fiesta Americana: Lobby Level - Stelaris Bar

039. HSS Retired Member Café y Pan Dulce
Breakfast
7:00 to 8:00 am, Friday 8 Nov.
Fiesta Americana: Lobby Level - Vallodalid

040. Early Sciences Forum
Business Meeting
8:00 to 9:30 am, Friday 8 Nov.
Fiesta Americana: 1st Floor - Izamal I
Chairs:
Mackenzie Anne Cooley, Hamilton College
Patrícia Martins Marcos, University of California, Los Angeles

041. Pacific Circle
Business Meeting
8:00 to 9:30 am, Friday 8 Nov.
Fiesta Americana: 1st Floor - Izamal II
Chair:
Sujit Sivasundaram, University of Cambridge

042. Back to the Future: How Historians Can Deprogram AI to Build Better Outcomes for Everyone
"Futures" Roundtables
8:00 to 9:30 am, Friday 8 Nov.
Holiday Inn: Lobby Level - Maya
AI boosters would have everyone believe that we are living in the “Age of AI” and even the “Fourth Industrial Revolution.” Indeed, a large part of the business of AI rests on the rhetoric of its potential rather than actual performance. Riding this wave of techno-enthusiasm, people in a range of sectors from the sciences and medicine to manufacturing and agriculture are rushing to incorporate algorithmic technologies and machine learning. As scholars, we can historicize and contextualize this bubble, whether comparing it to Tulip Mania or the more recent transformative promises of radio, television, the Internet, and even the Human Genome Project. To that end, the five participants for this HSS Futures Roundtable will address two interwoven questions. The first is: Where and how can we build truly interdisciplinary collaborations around these issues to intervene in the AI hype in a meaningful way? We know from our own professional experience and collaborations that fields ranging from communications and media studies to gender studies to public health and data science are actively questioning and critiquing AI. Our own discipline spans histories of public health and mental health to histories of biotech and brain science. How do we build connections? The second is: How can historians better showcase our expertise around all the infrastructures that comprise AI in order to build better outcomes? In particular, we are thinking about the ways in which data is constructed, how archives and texts are built, how bodies and communities are quantified. How can we take our critical historical frameworks, whether decolonization, or feminist STS, or queer theory, and contribute to the AI conversation? The five participants sharing answers to these questions represent a variety of perspectives from the histories of public health, psychology, computer sciences, digital intelligence, and media studies. An explicit goal of this roundtable is the production of a series of individually or co-authored short think pieces to be published somewhere like Zocalo Public Square, which syndicates to 290 media outlets worldwide.
Session Organizers:
Nancy J. Tomes, Stony Brook University
Joy Marie Lisi Rankin, Independent Scholar
Participants:
Ximena López Carrillo, Yale University
Paola Ricaurte Quijano, Tecnológico de Monterrey
Jonnie Penn, Cambridge University

043. Forum for the History of Health, Medicine, and the Life Sciences
Business Meeting
8:00 to 9:30 am, Friday 8 Nov.
Fiesta Americana: Lobby Level - Salon Celestun
The FHHMLS Distinguished Speaker for 2024 will be Mary X. Mitchell, who will deliver a talk titled “Residual Sovereignty: Bodies, Radionuclides, and the Birth of the Marshallese State.”
Chair:
Andrew J Hogan, Creighton University
Participant:
Mary X. Mitchell, University of Toronto

044. Earth and Environmental Sciences Forum
Business Meeting
8:00 to 9:30 am, Friday 8 Nov.
Fiesta Americana: Lobby Level - Salon Mérida

045. Forum for the History of the Mathematical Sciences
Business Meeting
8:00 to 9:30 am, Friday 8 Nov.
Holiday Inn: Lobby Level - San Jacinto
Chair:
Brittany Shields, University of Pennsylvania

046. GECC Welcome Room Day 2
8:00 to 5:00 pm, Friday 8 Nov.
Fiesta Americana: Lobby Level - Santa Lucia

047. Collections, Archives, Libraries, and Museums (CALM) Caucus
Business Meeting
8:00 to 9:30 am, Friday 8 Nov.
Holiday Inn: Lobby Level - Santiago
Chairs:
Elena Canadelli, University of Padova
Adrianna Link, American Philosophical Society
Catarina Madruga, Museum für Naturkunde Berlin, Humanities of Nature

048. Registration Day 2
8:00 to 5:00 pm, Friday 8 Nov.
Fiesta Americana: Yucatan Foyer Registration Desk

049. Forum on Science and Knowledge in Latin America and the Caribbean
Business Meeting
8:00 to 9:30 am, Friday 8 Nov.
Fiesta Americana: Lobby Level - Yucatan I
Chair:
Timothy Lorek, College of St. Scholastica

050. Forum for the History of Human Science
Business Meeting
8:00 to 9:30 am, Friday 8 Nov.
Fiesta Americana: Lobby Level - Yucatan II
Chairs:
Ayah Nuriddin
Emily Klancher Merchant, University of California, Davis

051. Forum for the History of the Chemical Sciences
Business Meeting
8:00 to 9:30 am, Friday 8 Nov.
Fiesta Americana: Lobby Level - Yucatan III
Chair:
Evan Hepler-Smith, Duke University

052. Forum for the History of Science in Asia
Business Meeting
8:00 to 9:30 am, Friday 8 Nov.
Fiesta Americana: Lobby Level - Yucatan IV
Chairs:
Jia-Chen Fu, Institute of Modern History, Academia Sinica
Sayori Ghoshal, Krea University

053. Exhibit Hall Day 1
9:00 to 5:00 pm, Friday 8 Nov.
Fiesta Americana: Yucatan Foyer

054. "Translation," Scientific Knowledge, and Collaboration in East Asia
Organized Session
10:00 to 11:30 am, Friday 8 Nov.
Fiesta Americana: 1st Floor - Izamal I
Although the literature on translation for the history of science is substantial, covering the movement of key texts across linguistic and cultural lines, this interest has tended to treat translation as primarily a transferal of knowledge from one language to another. And yet translation in science far exceeds any specific text and often entails questions of how to make moveable textual and tacit forms of knowledge within differently charged political contexts. If treated as also processes by which bodies of knowledge and sets of practices move across linguistic, cultural, economic, political, and geographic lines involving actors from different subfields trying to agree upon a shared set of working arrangements, we can recognize the socio-cultural contingency of translation and its importance as a form of intercultural contact. This panel takes up translation in a post-imperial/decolonizing East Asia as an on-going process of conceptual transformation and archival creation, which generates language for scientific ideas and situates them in new, different conceptual worlds. This panel brings together case studies from Japan, Korea, and Taiwan. In the aftermath of Japanese Empire (1895-1945, 1910-1945), scientific, social scientific, and technical actors in the region mobilized multiple models of practice and translation that could navigate the vicissitudes of empire and nation-state through science and technology. BuYun Chen explores the making (and preservation) of awamori, an Okinawan pre-colonial craft technology of brewing and the complex ways in which translation operated in the absence of texts. Jia-Chen Fu examines the multiples levels of translation involved in adopting new psychometric technologies in Taiwan and Japan in the 1950s and 1960s and how translational peregrinations were key to navigating and managing the multiple psychological models at play. John DiMoia examines how Korean demographers and social scientists learned to work with "Japanese" and "American" statistics, needing the latter for aid and to work with international organizations. Juyoung Lee explores how Korean engineers, trained during the Japanese colonial period, reidentified their expertise in postwar South Korea. Looking at bidding documents of South Korean engineering firms, translating past experiences into new professional, linguistic, and political modalities allowed these engineers to transition from roles in the Pacific War to becoming assets in the fight against Communism
Participants:

Distilling Culture(s): The Macro and Micro of Awamori *BuYun Chen, Swarthmore College*
In 2022, the Japanese government submitted an application for traditional brewing techniques to be added to UNESCO's Intangible Cultural Heritage List. Awamori, an Okinawan distilled spirit, is among the brewing traditions under consideration this year.

Frequently described as an embodiment of Okinawa's unique culture, the fermented and distilled rice-based liquor has a murky history. What historically constituted awamori—for example, millet or rice, obtained locally or by trade—as well as the origin of the technique has been much debated. The meaning of the name itself—awafor "foam" (referring to the technique), or awa for "millet" (referring to the grain)—also lacks consensus among scholars. Like other craft technologies practiced on the Ryukyu islands prior to colonization by Meiji Japan in the 1870s, the revival and continued production of awamori during the twentieth century depended on multiple acts of translation. A large proportion of the islands's archives were moved to Tokyo following its annexation and destroyed first in the 1923 Great Kantō Earthquake, while remaining archives and livelihoods were later destroyed during the Battle of Okinawa in 1945. This paper surveys the work of botanists, biologists, scientist-entrepreneurs, craftspeople, and pioneers of Okinawan studies to illustrate how the making (and preservation) of a centuries-old brewing tradition was intimately related to science, scholarship, and empire.

Postwar Emotions and Psychmetric Technologies in East Asia ***Jia-Chen Fu, Institute of Modern History, Academia Sinica***

How did psychologists construct emotion as an object of scientific inquiry during a period of transition and decolonization? In the first half of the twentieth century, working scientists in experimental psychology in China, Japan, and colonial Taiwan tackled emotion in similar yet different ways—the translation and application of psychometric tests as one of the ways in which we see divergent experiences and theorizations. Influenced by intellectual currents in Europe and the United States, East Asian psychologists tended to work within an emergent scientific view of emotions as purely physiological, nonintentional, and noncognitive processes that were nonetheless central to narratives of modernity. But in the aftermath of the Pacific War and the end of the Japanese empire, a handful of studies and surveys emerged that constructed certain emotions (notably fear and anxiety) as antagonistic to the formation of social, cultural, and racial identities that could navigate the complex realities of the postwar period. This paper seeks to explicate how certain emotions became marginalized and pathologized by exploring the translational peregrinations psychometric technologies have taken, leading up to and during the postwar period, as local actors attempted to enculturate science and make culture scientifically meaningful.

Perceptions and Statistics: Statistical Reform in South Korea, Post-1945 ***John P. DiMoia, Seoul National University***

In the aftermath of 1945, many claims could be found regarding Korean statistics, initially linked to the perceived deficiencies of the Japanese empire. So-called "Japanese" statistics needed to be removed, starting from the American occupation, and with this emphasis growing following the Korean War. Over time, these issues became more tangible, linked to the difficulty of translating the household registry system (hojeok, koseki) to the postwar needs of American / international statistics. This paper considers the generation of Korean scholars trained with imperial demography (often graduates of Keijo Imperial University), dating to the mid to late 1930s, and then retrained in the American system following the Korean War, as they individuals learned how to "translate" between models. The first to take degrees in demography, sociology, and rural development, these Koreans returned home to coordinate the receipt of aid, while running domestic programs. Especially as Family Planning became a major part of postwar state planning, this perception became part of a larger set of changes within ROK social sciences.

From Imperial Workers to Cold War Spearheads: Postwar Transformation of Korean Engineers in the 1950s ***Juyoung Lee, University of Pennsylvania***

This paper explores how Korean engineers, trained during the Japanese colonial period, reidentified their expertise in postwar South Korea. I analyze bidding documents from South Korean engineering firms, including resumes of their engineers from the early 1950s. These firms competed to win a contract to conduct the topological survey for the construction of the Mungyong Cement Plant, overseen by the United Nations Korean Reconstruction Agency (UNKRA). The documents reveal that these engineering professionals portrayed themselves as valuable workers in the new era of US-UN influence while also emphasizing their extensive experience gained during the colonial period. The engineers, who had previously worked for the colonial government and in industrial complexes in Manchuria and Hungnam, adopted strategies to prove their

value. These ranged from demonstrating proficiency in English to citing even minor collaborations with the US Army, such as constructing a warehouse. Existing literature on the history of engineers in postcolonial South Korea has largely focused on the scarcity of high-level engineers in the 1950s and often highlighted the Park Chung Hee era as the golden age for engineers. However, this paper shows that the work of engineers during the 1950s was easy to be overlooked due to the nature of their involvement in infrastructure projects. Through short-term contracts or as sub-contractors with entities such as the South Korean government, UNKRA, and the US Army, engineers transitioned from roles in the Pacific War to becoming assets in the fight against Communism.

Session Organizer:

Jia-Chen Fu, Institute of Modern History, Academia Sinica

Chair:

Jia-Chen Fu, Institute of Modern History, Academia Sinica

055. Religion and Science

Contributed Paper Session

10:00 to 11:30 am, Friday 8 Nov.

Fiesta Americana: 1st Floor - Izamal II

Participants:

"His Wisdom Has Given us Much to Wonder at": Dutch Geography and Religion around 1600
Alexander Daniel van Dijk, University of Cambridge

The historiography of the European early modern science of geography has omitted one important feature of this genre: its religious framing. Focussing on the 1596 account of India by the Dutch navigator Jan Huygen van Linschoten, and the 1602 account of west Africa by the merchant Pieter de Marees, this paper will argue that Dutch geographical, chorographical and ethnographical writitings around the turn of the seventeenth century are best considered as sacred geographies: i.e descriptive accounts of the natural world that placed it firmly within a Christian reality, but also gave this established reality new shapes. The lives of both authors were touched by religious turmoil, and they explicitly discussed their religious motivations for writing their works. Both authors placed the regions they analysed in Christian conceptions of history and space, and they were deeply concerned with describing local religions through Christian labels. Significantly, they also offered detailed natural historical descriptions of plants and animals in order to reclaim nature for Christian devotion. At the same time, Marees' and Linschoten's encounter with other cultures also transformed the Christian categories they used to analyse these very cultures. To deal with the problem of religious diversity, Linschoten presented religions as 'customs and ceremonies' that were compatible under an abstracted Christianity that prioritised a curious approach to the natural world, and Marees incorporated practices previously understood as magical into the Reformed concept of idolatry. My paper complicates the recent arguments of Brian Ogilvie, Harold Cook, Benjamin Schmidt, and Joan Pau Rubiés.

Between Suspicion and Superstition: A Demonological History of Western Psychiatry
Kaitlin Smith, Harvard University

Western thinkers have long identified belief in spirits as signaling a gulf in rationality that divides the modern west from pre-modern ancestors and neighbors in the Global South. Such formulations lay bare some of the challenges that confront the project of developing global histories of psychiatry given the simultaneous centrality of phenomenological issues and diversity of metaphysical presumptions. This paper seeks to trouble this binary conceptualization of psychiatric reason by exploring the demonological heritage of western psychiatry through the prism of the 1563 book De Praestigiis Daemonum—penned by one of the field's founding figures, Dutch physician Johann Wier. The analysis that follows considers why Wier's psychiatric thought—infused as it was with demonology—remained an object of celebration and critique well after the Enlightenment and the professionalization of psychiatry as an enterprise purportedly grounded in unassailable biological fact. After unpacking Wier's central contributions in his book, this paper traces the circulation of his text with a focus on how psychiatric figures deployed his ideas to negotiate ongoing challenges related to the contested scientificity of the field. What emerges from this investigation is a western psychiatric tradition in which a revolving cast of figures have maintained a long fascination with demons and exhibited readiness to deploy demonological ideas to navigate the cascade of etiological, social, and professional puzzles that have confronted the field. The paper concludes with

a discussion of the implications of this renarrativization for the projects of transcultural psychiatry and the global history of medicine more broadly.

"No More Shabbos?" Electric Lights and Jewish Law in the Interwar Yiddish Daily *Morning Journal* *Alona Bach, Massachusetts Institute of Technology*

As access to incandescent illumination expanded during the first few decades of the twentieth century, the halachic (Jewish legal) status of electricity was debated transnationally, eventually producing prohibitions against turning on electric lights on the Sabbath. Yet, as this paper argues, far from a rejection of electric lights altogether, these prohibitions instead kindled both religious innovation (interpreting strictures and applying them to new technologies, thereby shaping new use practices) and technological innovation (inventing or adapting new technologies to fit religious precepts). I show this by tracking emergent cultural meanings of electric light as they circulated and were debated in The Jewish Morning Journal, an Orthodox Yiddish daily newspaper. While the newspaper suggested alternatives (technical and otherwise) to turning on lights on the Sabbath, it also participated in the discursive normalization of new Orthodox use practices of electric lights, including the trope of non-use of electric light as a metonym for Orthodox Sabbath observance. This trope was reproduced within the Orthodox community to such an extent that the paper could plausibly report toddlers echoing it. Overall, the Morning Journal offers a window into the development of religious tradition entangled with technology, rejecting the notion that the two are necessarily opposed (the "conflict thesis" of religion and technoscience) or part of a linear progression (the secularization thesis). Instead, in conversation with STS scholarship on users, this paper uses Orthodox Yiddish discourse about electric light as a case study for discussing cultural meanings of technology across geopolitical borders and among non-hegemonic groups.

Climate Activism Among U.S. Catholic Sisters: Defending Science While Integrating Other Ways of Knowing *Sabrina Danielsen, Creighton University*

The issue of environmental degradation and climate change has been discussed and debated in the Catholic Church with a growing sense of urgency over the past half-century. This presentation explores the joint mobilization of scientific and other knowledge systems by U.S. Catholic sisters (also called women religious or nuns) in claims-making and activism on environmental issues. In his 2015 ecological encyclical Laudato Si', Pope Francis drew heavily on scientific research to support the reality and urgency of climate change. However, in my analysis of over 12,000 columns written by U.S. Catholic bishops, I have found that some bishops described Pope Francis as "not a scientist" and conveyed a misleading message that climate change is contested within the scientific community. I have also conducted 40 oral histories with American Catholic sisters who are leaders in environmental activism. These interviews reveal that sisters draw heavily on scientific narratives in their climate advocacy. As science studies scholars have previously described, including Steven Epstein in the case of AIDS activists, Catholic sisters found that the mobilization of scientific knowledge in their advocacy required them to learn the language and norms of science, sometimes through graduate degrees. Nonetheless, many sisters also learned that a narrow focus on scientific facts was often insufficient. Their audiences were often better convinced and motivated by the integration of scientific knowledge with humanistic narratives. In this presentation, I argue that the sisters' sense of "boundary work" between scientific and other cultural understandings of climate change was more integrative than exclusionary. This ability to seamlessly integrate distinct ways of knowing in their climate activism was also facilitated by sisters' relatively marginal position in the Church, especially in comparison with bishop's hierarchical roles and close political ties with the U.S. Republican party.

Chair:

Matthew Shindell, Smithsonian National Air and Space Museum

056. (Self) Surveillance, Data Visualization, and the Long History of AI from Analogue to Digital

Organized Session

10:00 to 11:30 am, Friday 8 Nov.

Holiday Inn: Lobby Level - Maya

This panel examines the history of so-called "AI" as a tool of surveillance and data collection from the mid-twentieth century. Moving through multiple domains including self-tracking, data visualization in photography, pattern recognition, and age progression,

our work is in productive tension with and offers grounded challenges to techno-deterministic narratives that frame surveillance as caused by or inherent to AI. As we show, AI is part of a much longer history of practices of capture, measurement, representation, tracking, and analysis.

Participants:

Objectivity and Obfuscation in the Data Visualizations of Self-Tracking ***Jonathan Finn, Wilfrid Laurier University***

As part of Martschukat's 'Age of Fitness' (2021), self-tracking has become a dominant practice within contemporary society. While this rise in practice has been met by a parallel rise in scholarship, very little attention has been paid to the data visualizations of self-tracking. Graphs, charts, maps and other representations produced by smart watches and their companion apps are offered to users as evidence of various physiological states from sleep and recovery to optimal training loads and over-exertion. In this way, the efficacy of self-tracking is largely dependent on its data visualizations. This paper addresses the data visualizations of self-tracking in relation to the larger history of scientific image-making. The digital displays of contemporary self-tracking borrow and benefit from the legacies of their analogue predecessors. Drawing from a research project on self-tracking in endurance sport, the paper examines the ways in which data visualizations make claims to objectivity and the extent to which such claims obfuscate the many significant material and cultural issues of self-tracking.

Aerial Photography and AI ***Kelly Gates, University of California, San Diego***

The landscape of Northern Virginia is undergoing an historically unprecedented transformation. The "AI revolution" has spurred a major data center building boom, clearing forests and farmlands and erecting in their place one enormous cement warehouse after another. These buildings are filled with the computational machines powering what is now being called "artificial intelligence." This paper examines the efforts underway to photographically document the data center building boom in Northern Virginia and elsewhere. I argue that photographic and other means of visualizing data infrastructure expansion are essential to the historical contextualization of AI.

"Computers for Intelligence": On Surveillance through AI in the Cold War ***Aaron Gluck-Thaler, Harvard University***

Pattern recognition is a scientific technique often used for data-based surveillance. Pattern recognition involves extracting certain features from known examples, separating those examples into distinct classes, and then using those classes to identify unknown examples. This paper considers how and why mid-century intelligence agencies in the United States became interested in computerized pattern recognition and allied research in artificial intelligence (AI) and machine learning. I argue this interest was in part the product of the work that select scientists did to transform problems of government surveillance into problems of pattern recognition, and vice versa.

Sunrise, Sunset: The Analogue and Digital History of Age Progression ***Sharrona Pearl, Texas Christian University***

For a brief period in 2019, it became a trend, a meme, and for many, a source of cringe; for the companies harvesting your data, the 10- year challenge was the jackpot. These comparative photos provided rich points of comparison to build a database of how faces age over time, powering algorithms to provide ever (and eerily) more accurate age progression images. This age progression process differs in meaningful ways from the artistic techniques used to age faces pioneered by forensic portraiture, finding wide application (on milk cartons!) during the moral panic around child abductions in the 1970s and 1980s. In this presentation, I'll discuss the long history of age progression from analogue to digital, considering the deep social pressures driving these AI technologies and how they are deployed over time. I'll draw on artists' manuals, police data, technical literature, and cultural representations to discuss the uses of age progression and the biases embedded within.

Session Organizer:

Sharrona Pearl, Texas Christian University

Chair:

Sharrona Pearl, Texas Christian University

057. Debating Disability

Contributed Paper Session

10:00 to 11:30 am, Friday 8 Nov.

Fiesta Americana: Lobby Level - Salon Celestun

Participants:

Boys on the Boat: 'Able' and 'Disabled' Seamen in the Seventeenth-Century British Navy ***Annastasia Conner, University of Chicago***

On the forefront of recent work in disability history is the idea that disability was not always historically considered a permanent transition to a new embodied state, which would then be maintained until one's death. By investigating seventeenth-century British naval archives, this paper will show that (mostly) male seamen and naval officers experienced a more fluid experience of physical ability both during and after their periods of service, and that official institutions recognized this fluidity and responded to it as a 'normal' state of affairs. In some cases, seamen previously injured in the service later tried to re-enlist and requested to serve in a different capacity due to physical or age-related criteria. This suggests that these injured men experienced a period of disability that came to an end at some point, and that after the end of this period, they desired to return to their previous profession. Petitions and financial records also suggest that men who had experienced injuries in service and received pensions, whether from Navy, community, or parish, in some cases received this on a limited basis, and that they could be withdrawn with the end of a period of disability (based on the report of the pensioner regarding their physical state). The seventeenth century was a politically fraught period in English history, and this paper will examine whether and how these interactions between individuals and institutions in relation to physical debility, both temporary and permanent, changed over the course of several key conflicts.

Disability and the American Humane Movement
Kat Poje, Harvard University

In a special issue of Lateral, Julie Minich writes: "The methodology of disability studies…involves scrutinizing not bodily or mental impairments but the social norms that define particular attributes as impairments, as well as the social conditions that concentrate stigmatized attributes in particular populations" (2016). Taking up Minich's conception of disability studies as method, this paper examines the way the early twentieth-century American humane movement conceptualized the (un)fit human and the (un)fit animal. Legally endowed with police powers over child and animal welfare, humane organizations could separate children from their families, send children to asylums, reform schools, and jails, and euthanize or rehome animals, all in the name of preventing suffering and ensuring the health of the American nation. This paper shows that eugenics profoundly influenced humane advocates' evaluations of their charges' fitness and the methods of social reform which they deployed. And it demonstrates that notions of disability crossed human-animal boundaries, as humane organizations sought to make multispecies fit families.

Disability, Rehabilitation, and Reclamation in South Korea, 1960-2024 ***Wonik Son, Yale University***

This paper approaches the project of land reclamation in South Korea in the twentieth and twenty-first centuries through the methodological lens of disability, debility, and the built environment. Korea's postwar pursuit of reclamation came amidst demands for new agricultural land, and later, envisioned as new logistical spaces for free trade and tourism. My work hopes to negotiate the role of reclamation as metaphor – how do questions of "rehabilitating," "reclaiming," and "reordering" landscapes operate as metaphor? And how does metaphor open the possibility of examining landscapes and built spaces within the biopolitical lens of disability and debility as methodology? Is "productive" space "accessible" space? The Korean developmentalist state's imagination of projects of reclaimed land and large infrastructure are "extractive" in their vision of productive space and productive people; "disruptive" in the sensorial sense of the visceral and the violent as faces of mountains are cut and tidal flats are filled. Landscapes in the project of reclamation are sites of fragmentation, displacement, and disorientation across temporal and spatial scales – projects facing ephemerality amidst illusions of permanence. Taking notions of "compost" and the "right to maim," I hope to explore landscapes, much as those that populate it, as bodies available for maiming and violence, and through the role of memory, prosthesis, and loss. Through two sites of tidal land reclamation in Korea – Seosan and Saemangeum – this paper brings questions of labor, the disruption of habitats, empty/emptying space, and the anxieties of population and aging to broad discussions on health and lived landscapes.

Chair:
Leah Malamut, University of Minnesota

058. Craft Knowledge

Contributed Paper Session
10:00 to 11:30 am, Friday 8 Nov.
Fiesta Americana: Lobby Level - Salon Mérida
Participants:

Henequén: Decortication Techniques & Plant Fiber Materiality *Michelle Ha, Stanford University*

Agave fibers commercially sold as “henequén” are considered the “green gold” of Mexico’s Yucatán Peninsula that ushered in the region’s nineteenth-century gilded age, the legacy of which is highly visible in our conference host site, Mérida. Henequén was sought after by imperial actors since the Spanish colonial era for a variety of strategic materials, including maritime cordage and binder twine for agricultural harvesting machines. Economic histories of the Yucatán Peninsula and commodity histories of henequén generally assert that the development of decorticating machines that could efficiently scrape pulp from agave blades—the most labor intensive and costly part of the fiber extraction process—allowed for henequén production at scale and were thus pivotal in the Yucatán’s transformation into a lucrative agave fiber monocrop economy. This paper takes up the assumption that mechanization increases efficiency in production as a question for further study, foregrounding considerations of what gets produced and how that product is selected among competing alternatives. Contextualizing henequén within the longer histories of agave fiber decortication tools and techniques and the broader social and cultural horizons of the worlds in which such technologies were engineered and practiced reframes the history of the Yucatecan agave fiber industry as one in which a narrow capitalist agenda catering to the demands of the global hard fibers market was prioritized at the expense of other competing manufacturing knowledges and practices, including Indigenous traditions and lifeways. This study thus presents a history of henequén’s transformation into an industrial coarse fiber and raw material.

Imperfect Biscuits: Contractors and Commissioners in 18th-Century London *Elis Nielsen, Brown University*

This paper explores the socio-economic dynamics of early eighteenth-century Britain through the story of John Kelly, an on-again, off-again biscuit baker for the British Navy. Kelly appears in the Victualling Office records as a self-proclaimed projector, offering ways to improve ship’s biscuit and save the government money. Tracing Kelly’s plans and petitions for innovation, and his triumphs, and failures between the 1690s and 1720s, Kelly’s story illuminates a rich narrative of his attempts to claim patronage for his projects under the purview of the Victualling Office. Imperfect Biscuits highlights not only the operational challenges of contracting, but the social implications of his interactions with a frequently changing board of elite commissioners. Through the analysis of correspondence, meeting minutes, and published petitions, this paper traces how an ordinary laborer-cum-projector navigated the complexities and bureaucratic mechanisms to advocate for his livelihood as a baker. This paper engages with the recent work on early modern projectors while thinking specifically about the laborers and contractors, who, while not directly on the maritime frontline, significantly supported Britain’s global naval operations from what is now East London. By examining Kelly’s persistent, yet often unsuccessful, interactions with the Victualling Board, this paper contributes to an understanding of the intersections between individual agency and institutional practices in early modern Britain. This approach not only enriches the historiography of the British maritime world, but offers a way of approaching in the social history of science in eighteenth-century Britain through narrative

“The Most Valuable of All Indian Trees”: Indigenous Knowledge in East India Company Shipyards in South Asia *Urna Mukherjee, Johns Hopkins University*

Ships built during the eighteenth and nineteenth centuries at East India Company shipyards like Bombay and Cochin were constructed of Malabar teak - a wood timber that was highly prized by South Asian shipbuilders for the preservative qualities of its natural oils and its greater resilience to extreme climates compared to European standard shipbuilding woods like oak. As all of Europe faced a timber shortage at the end of the Seven Years’ War in 1763, and alternative sources of timber began being sought in overseas colonies, both teak as a building material and teak-built ships became much sought after. My paper will explore the sourcing and mobilisation of Malabar teak for shipbuilding in Bombay and Cochin between

the late eighteenth and early nineteenth centuries and the varying relations of dependence and coercion between the European factors and their South Asian contractors. Teak grew sporadically in the tropical evergreen rainforests of the Southwestern part of India and its acquisition for shipbuilding was reliant on the knowledge and expertise of forest-dwelling communities, diplomatic relations with local political powers and bargaining capacity with the long established trading networks of the region. My paper proposes to read historical sources strategically and creatively across a variety of genres as well as use material and visual sources to explore the history of the rarely mentioned local and indigenous collaborators at European sites of shipbuilding in eighteenth-nineteenth century South Asia.

Crafting the Story of the Glassmakers of Herat
Anna Riley, Harvard University

From the 1960s to the present, stories have circulated about the famous blue glass made in Herat, Afghanistan. Of these, one story has been particularly durable, devised by American material scientist Robert Brill (1929–2021). Upon first witnessing the work of Herati glassmakers during a Smithsonian-funded expedition in 1968, Brill posited that their techniques were the last remaining “vestiges” of ancient Mesopotamian traditions. They made their glass from scratch using a combination of quartz pebbles and a plant ash called “ishgar.” Brill’s hypothesis coincided with contemporary debates over new translations of cuneiform glassmaking instructions and new archaeological excavations of ancient glass furnaces. Motivated to salvage this artistic tradition before it was lost, Brill made a documentary called “The Glassmakers of Herat” (1979). The film’s familiar storyline was shaped by romantic ideas of the authenticity of traditional handicrafts combined with anxiety about potential cultural loss as a result of oncoming modernity. Through the examination of expedition reports, scholarly texts, films, and objects themselves, this paper will analyze the making of the film as part of an earlier generation of scientific debate that continues to shape the perceived value and authenticity of Herati glass in the present. In uncovering the unlikely story and consequences of this film, this paper traces an intersection between the history of material science, salvage anthropology, and the study of craft practice outside of the Global North.

Chair:
Denise Phillips, University of Tennessee

059. Reconsidering the Pasts of Mathematical Historiography: Math History’s Strategic, Accidental, or Just Unfortunate Oversights
Organized Session
10:00 to 11:30 am, Friday 8 Nov.
Holiday Inn: Lobby Level - San Jacinto

Histories of mathematics regularly describe math as “the language of”—of science, of demographics, of the information economy, and so on. The use of such language has pervasive reach on culture; mathematics is largely and unquestioningly accepted as fundamental to core components of modern society, in part due to the ways in which we ascribe language to its importance. This panel examines the "language of" mathematics as those narrative structures and rhetorical tools utilized in writings about mathematics and its history, examining how 20th century accounts of the history and practice of math function as cultural objects. The panel aims to shed new light on not only mathematical historiography, but how decisions about writing about the further past reflect particular goals and activities. Presenter 1 analyzes George Pólya’s 1945 book How to Solve It. Using stemmatics, it locates the book’s popularity in traditions of philosophical essays as well as mathematical texts. Presenter 2 analyzes a Puerto Rican counting song’s presence in 1950s Midwestern ethnomusicology/folklore, to reevaluate the place of Spanish-language sources in U.S. histories of mathematics education. In particular, it comes to argue that the song should be considered in historiographies of mathematics in addition to subfields of anthropology. Presenter 3 looks to the broader twentieth-century patterns in justifications for K-12 mathematics education in the U.S. The paper notes the uses of historical stories in sources such as proposals, editorials, speeches, and reports, arguing for shifts in the strategic uses of history throughout the century. Presenter 4 investigates the mathematization thesis behind visions for the Scientific Revolution from Koyré and Dijksterhuis. Noting the significance of Archimedes in work of these scholars and their successors, it reorients understandings of this historiography in early-twentieth-century views of mathematical abstraction and ancient Greece. This panel is organized and sponsored by the HSS Forum for the History of the Mathematical Sciences.

Participants:

How to Write It: Considering Stemmatics as Evidence for George Pólya’s *How To Solve It*
J.P. Ascher, University of Edinburgh

George Pólya wrote his globally best-selling How To Solve It (HSI, 1945) based on a

decade of accumulated notes, lesson plans, and proofs regarding mathematical heuristics. Originally a sort of Montaigne-style collection of essays and literary anecdotes, the book was cut down for the textbook market by a canny editor at Princeton University Press. As a text, however, it still contains the traces of its complicated genesis and begins an interlocking series of four books that present part of the full complexity of Pólya's thought on heuristics. As the author of such a globally popular book, Pólya as celebrity mathematician obscures our understanding of Pólya as essayist. This paper introduces the use of stemmatics to analyze the history of HSI and its place not only in the history of mathematics, but in the history of philosophical essays.

"Dos y Dos son Cuatro": Reassessing the Place of Spanish-language Sources in Histories of American Mathematics Education ***Andrew Fiss, Michigan Technological University***

In 1958, Midwest Folklore from Indiana University published a "recovery" of a Puerto Rican counting song, "Dos y dos son cuatro." The song listed the increases in twos through the number ten. Then, in a second verse, it commanded "brinca la tablita" (erase the slate), joking in the voice of the teacher, that the teacher erased it before the lesson and needed to rest now. The song had been sung in classrooms of the island for at least a generation, yet its incorporation in a mid-century U.S. folklore journal led to its subsequent publication in volumes of ethnomusicology and broadly anthropology from the 1950s until now. Comparing the song's documentation with publications about American mathematics education of the early to mid twentieth century, this paper uses "dos y dos son cuatro" as a case study in showing the absence of Spanish-language sources in relevant historiography. As Puerto Rico was a U.S. territory, its counting songs were relevant to histories of American mathematics education, showing creative approaches to numeracy and responses to relevant classroom technology. Using techniques of book history as well as memoir, this paper argues that Puerto Rican counting songs are not only elements of folklore but also historical evidence of American mathematics pedagogy.

A Historiography of the Mathematics Classroom: How Narratives about the Past Directed Math Education Reform in the 20th Century United States ***Emily Hamilton, University of Massachusetts, Amherst***

Education reform efforts are forward facing, in that they aim to improve pedagogy and tailor content for future cohorts of students. The promise of reform, though, relies on an understanding that new approaches should replace past traditions. In math education, there is a rich tradition in the US of employing historical narratives to justify support for curriculum reforms. Early 20th century calls for reform rely heavily on rhetoric about the Early Republic's conscious structuring of the K-12 curriculum to mold the ideal American citizen. Math training was understood as crucial to strengthening the "mental muscles" and preparing citizens for productive engagement in the workforce. Maintaining nationalistic values through classroom training is routinely described as a patriotic duty throughout the 20th century, even as the skills and characteristics of the "ideal" American citizen shifted; so too, then, did the requirements for mathematics education. As a changing political, economic, and militaristic landscape of the 20th century US ushered in new expectations for mathematics training in the schools, calls for reform regularly included rueful summaries of past failures in the nation's classrooms, presented as unfavorable comparisons to the promise of proposed reforms. Studying the history of math education reform, then, uncovers a wealth of historical narratives woven into funding proposals, editorials, appeals to Congress, election-year speeches, and in books and reports from Johnny Can't Add to A Nation at Risk. This paper explores these histories, examining the ways in which narrative structure, authorship, and presentation shifts over the course of the 20th century, as a way to understand how 20th century reformers understood their own history as a valuable rhetorical tool.

The Archimedean Point of Modern Science: Dijksterhuis' and Koyré's Scientific Revolution ***Elizabeth A. Hunter, University of Chicago***

Since the 1960s scholars have been revising or outright dismissing the "scientific revolution" as a self-evident historical and philosophical concept with the result that any mention requires many qualifications. Although one of its earliest components, the mathematization of nature, has been critiqued almost as thoroughly, the belief that modernity began when great thinkers submitted natural

phenomena to mathematical principles still prevails in scholarship and popular media. The mathematization thesis first gained prominence in the works of Eduard Jan Dijksterhuis (Val en Worp, 1924) and Alexandre Koyré (Études Galiléennes, 1939/1940). Despite disagreeing on the ontological nature of mathematization, both credited an unlikely figure as the progenitor of modern scientific thinking, the ancient Greek mathematician Archimedes of Syracuse. While their conception of the scientific revolution has been discarded, their work on Archimedes continues to be cited. To understand why the mathematization of nature remains epistemologically appealing and politically salient today, we need to understand how the narrative was created and, most critically, how anachronism shaped its formation. This presentation evaluates arguments made by Dijksterhuis and Koyrè respectively concerning the great significance of Archimedes' works in the scientific revolution and why they made Archimedes their hero. I argue that the two distinct views of mathematization convening on the figure of Archimedes is rooted in twentieth-century concerns for the foundations of geometry and general anxieties over abstraction as found in David Hilbert's and Edmund Husserl's works, as well as the desire to link the present to classical Greece.

Session Organizer:
Andrew Fiss, Michigan Technological University

Chair:
Andrew Fiss, Michigan Technological University

060. Mexican Commodity Frontiers and the Making of Knowledge

Roundtable
10:00 to 11:30 am, Friday 8 Nov.
Holiday Inn: Lobby Level - Santiago

The concept of 'commodity frontier' has increasingly been used in recent years to critically analyze the sites and historical processes that have led to the incorporation of natural resources, land, and labor into the expanding world economy. However, the skills and expertise necessary for resource extraction and processing in such commodity frontiers have been less thoroughly explored, and they are often seen as mere sources of raw materials rather than as places of knowledge production and exchange. This roundtable aims to bring together the history of science and the history of commodity frontiers in México during the 19th and 20th centuries. The primary aim is to consider how tropical frontiers have been important sites for knowledge production and the development of techno-science by locals and transnational actors. The participants will discuss how Mexican haciendas, forests, and plantations facilitate the generation and circulation of knowledge, including experimentation, trans-local interactions, and exchanges, while also exploring how the production of commodities—such as henequen, chicle, soy, avocado, timber, and honey—triggered local and global scientific research. Perhaps most significantly, we will also reflect on the historiographical and epistemological significance of considering subaltern agents in plantations, haciendas, and forests as active contributors to scientific knowledge, in different landscapes from the Purépecha Highlands to the Maya Forest. The participants in this roundtable are based in México, Spain and the United States. The session will be bilingual in English and Spanish, with half of the presenters discussing the case of commodity frontiers in the Yucatán Peninsula. All in all, this roundtable takes us to a completely different historical context of the making of knowledge and opens the possibility of an alternative history of science.

Session Organizers:
Angélica Márquez-Osuna, Harvard University
David Pretel, Universidad Autónoma de Madrid

Chair:
Gabriela Soto Laveaga, Harvard University

Participants:
Viridiana Hernández Fernández, University of Iowa
Diana Alejandra Méndez Rojas, Centro de Investigaciones sobre América Latina y el Caribe, Universidad Nacional Autónoma de México
Fernando Pérez-Montesinos, University of California, Los Angeles
Rachel Steely, Harvard University
David Pretel, Universidad Autónoma de Madrid
Angélica Márquez-Osuna, Harvard University

061. Routes of Indigenous and Universal Knowledges from Latin America, 1830-2030

Organized Session
10:00 to 11:30 am, Friday 8 Nov.
Fiesta Americana: Lobby Level - Yucatan I

In the century after Independence in mainland Latin America, republican and imperial scholars, from within the region and without, sought medicines, sciences and knowledges supposedly suppressed by or lost to colonial Spanish and Portuguese rule. Some contemporary male scholars claimed these practices as "national" inheritances, while others delimited them as "local" or "Indigenous" superstitions more fit for ethnographic study. While historians have have fruitfully worked to recover these science's possibly original and Indigenous character, others have questioned those distinctions altogether. The four

papers in this panel attend to these questions by connecting the routes of knowledge created by assemblages of itinerant healers, epidemiologists, forest-dwellers, collectors, and scholars between the Caribbean, Andes, Amazon, Europe, and Australasia, from the late 19th century and early 21st century. Together, they outline three processes that might inform a more Latin American history of global science: the radical refusal of racialized or nationalized identities that led some Indigenous, Black, and European American male and female actors to re-articulate, together, more universal knowledges of plants, animals, and climates in the Global South; the re-collection of putatively pre-Columbian knowledges of bodies, healing, and disease that reveal more polycentric empires of knowledge during colonial rule; and three, the role of nationalism and informal empire, despite decolonization, that preserves these materials and even subjects of that history in museums, universities, herbariums, and archives today. These routes are still open, encouraging scholarly and communal heirs to “stay with the trouble” (Haraway 2016) of recognizing connection here in the twenty-first century.

Participants:

Auto/biographical Processes and Pathways of Botanical Knowledge Traditions in the Nineteenth- Century Andean Region ***Marcia Stephenson, Purdue University***

During the final decades of his life, former smuggler and trader Charles Ledger (1818-1905) corresponded with prominent botanists of the time, notably British quinologist John Elliot Howard (1807-1883), and he published observations on the usefulness of Andean medicinal plants. In the documents, one finds fragments of life histories, including incidents from Ledger’s own Andean journeys. These sources introduce stories of indigenous protagonists with whom he traveled while on the road. The best known of these is Ledger’s Andean servant Manuel Incra Mamani, the man Ledger credits with teaching him about the varieties of cinchona. Thanks to Mamani’s expertise and Ledger’s international connections, treatment for malaria reached Europe and Dutch colonies in Java. While Ledger’s portrayal of Mamani and his role in communicating local botanical knowledge has become an essential source for scholarship on the history of quinine, his partial narratives of other Andean specialists have largely been neglected. Making use of an interdisciplinary approach that brings together current research on biography and the history of science (Musselman, Terrall, Raj, Richards), this paper examines selections of Ledger’s travel accounts, letters, and periodical publications to give attention to the life histories that he wove throughout these documents, especially as they pertain to the itinerant Kallawaya healers. This avenue of investigation sheds light on heretofore unexamined intercultural spaces of Andean botanical knowledge traditions and the itineraries of their dissemination. Moreover, it elicits from these documents narratives and protagonists otherwise marginalized or absent from mainstream scientific and cultural debates of the nineteenth century.

“Xekik: Maya Healing and History in Carlos Finlay’s Epidemiology of Yellow Fever” ***Farren Yero, Binghamton University***

In 1892, Cuban epidemiologist Carlos Finlay published "Yellow Fever, Before and After the Discovery of America," where he argued that the virus, after centuries of debate, was at last proven to be native to the Americas. His source was the Maya codice collection known as the Books of Chilam Balam. The Havana-based El Diario de la Marina had printed a Spanish translation from the Codice Chumayel, along with excerpts from a treatise on the subject, published by the Maya Bishop of Yucatán, Crescencio Carrillo Ancona. Finlay and Carrillo began to work together, examining Maya codices for linguistic evidence of symptoms and researching early Spanish chronicles to make calendrical calculations and chart the epidemiology of the virus through philological study. The paper draws on the correspondence between Finlay and Carrillo, along with their related publications, to understand the role of Maya language, history, and cosmology in the etiology and epidemiology of yellow fever. In doing so, the paper attends to the imperial epistemologies about evidence and knowledge that informed these methods, even as it situates this intellectual exchange within the global south, challenging histories of medicine that privilege the United States Army as "confirming" Finlay's theories (most notably his observation on mosquito vectors through the Walter Reed Commission). Centering the Circum-Caribbean as a key site of medical knowledge production, the paper further considers the material effects of Finlay and Carrillo's claims for the living Maya, then under martial threat in the decades-long conflict known as the Caste War (1847–1901).

Universal Knowledges in an Ancestral Andean Mask in the Smithsonian, 1608-2024 ***Christopher Heaney, Pennsylvania State University***

To the pre-Christian peoples of Huarochirí, in Peru's Central Andes, dancing with a facial-bone mask, a huayo, re-animated the dead, honored ancestral victories, and ensured the yearly recycling of waters between sacred mountains and the Pacific Ocean. Following those masks' description in the c. 1608 Quechua-language manuscript of Huarochirí, scholars have accepted claims by Spanish priests that they extirpated "idolatries" such as these. This paper explains how U.S. and Peruvian historians and anthropologists are collaborating with a Huarochirí town to use archival records and the Quechua manuscript to locate a huayo that survived the extirpations but was extracted and sold with other ancestral remains in 1888, by a North American who presented the lot as a collection fit for scientific, anatomical and ethnographic study. Today, the mask sits in storage in the Smithsonian's National Museum of Natural History, in Washington, D.C., and its re-encounter study, and mooted return, models how nineteenth century archival traces can be used to complicate unidirectional narratives of imperial scientific extraction. Identified here are not just knowledge-making practices and cosmologies from Indigenous America, but actual actor-subjects, whose material re-collection by lineal descendants can make the history of science more action-oriented in its concerns. This paper further explains how community members have recontextualized the huayo by aligning it with contemporary masked dances whose more universal knowledges memorialize the violence of modern regimes of mining and climate change. This collaborative history of science thereby engages the ethics of re-connecting an ancestral, social, and agricultural technology that may still regulate our relations.

Cultivating Collaborative Networks of Knowledge: Ynés Mexía's Botanical Expeditions to Brazil ***Michelle Medeiros, Marquette University***

In 1931, Mexican-American botanist Ynés Mexía (1870-1938) started a 3,000-mile journey to collect botanical specimens in the Brazilian Amazon. Mexía built an impressive collection of over 9,000 specimens, including valuable information regarding local knowledge in each botanical voucher she collected. The Ynés Mexia Digital Database of Medicinal Plants (https://www.ynesmexiadatabase.com) is an inventory of the medicinal plants she collected in Brazil, including their location, scientific and vernacular names, and popular uses. The materials provided in the database reveal details on how Mexía: 1) nurtured symbiotic connections with local communities and indigenous people, 2) recognized their deep understanding and connection with the plants and their uses, and 3) considered their empiric knowledge scientifically relevant. Although Mexía remained excluded from the mainstream of scientific conversations, she created a complex system to distribute her collections across the globe, inscribing this local knowledge within the Western system despite her gender or lack of institutional support. The untold stories that emerge from her collections produce a counter-narrative to the discourses surrounding local knowledge, women scientists, and fieldwork. They shed new light on the diverse perspectives that shaped knowledge production in Brazil and beyond, underscoring the significance of inclusive collaboration in advancing scientific expertise. In attempting to document and propagate local knowledge within the mainstream of science, Mexía anticipated connections between plants and humanities, a now emerging field of research exploring the interdisciplinary study of plants to better understand their importance to human culture.

Session Organizer:

Christopher Heaney, Pennsylvania State University

Chair:

Christopher Heaney, Pennsylvania State University

062. Approaching Détente in Uncertain Times: Historians of Anthropology Encounter Historians of the Human Sciences

Organized Session

10:00 to 11:30 am, Friday 8 Nov.

Fiesta Americana: Lobby Level - Yucatan II

The past 60 years have seen a variety of periods of waxing and waning interest in and attention to the history of anthropology as a topic of inquiry, with both historical and historiographical analyses conducted by anthropologists and by historians of the human sciences. Throughout this period, there have also been ongoing debates about whether the history of the discipline is best written by practitioners trained in anthropology or scholars trained as historians. Recent

work in the history of science on questions of labor, expertise, and "the field," and scholarship drawing on Indigenous Studies, have created new opportunities for dialogue among scholars working across the history of anthropology and the history of the human sciences. Emphasizing these recent trends, the papers in this session will contribute new approaches to understanding how anthropologists and historians of the human sciences approach the discipline, particularly with regard to knowledge production and circulation both within anthropology and with its ostensible objects of study since the middle of the twentieth century. Like other social sciences, anthropology is marked by its own imperfect pasts and uncertain futures, but work on its history and historiography from the perspective of both the discipline and the history of the human sciences promises to bring new approaches to these pasts into focus and engage with ongoing debates about the current and future place of anthropology both in the world and among the other human sciences.

Participants:

The History of Anthropology as a Historiographical Question ***Robert Hancock, University of Victoria***

The origins of a self-consciously historiographical orientation to the history of anthropology can be traced to the "Conference on the History of Anthropology" funded by SSRC in 1962. Although there had been earlier work on the history of the discipline, this conference marked the emergence of an intentional focus on how the history of the discipline was being and should be written in dialogue between anthropologists and historians. In the subsequent years, historical studies of anthropology diverged not only along regional or national lines but also between scholars trained in anthropological traditions and those trained as historians of science, particularly in the history of the human or social sciences. Thus, the question is not only whether the history of anthropology is properly the domain of insider-anthropologists or outsider-historians (pace George W. Stocking, Jr.) but how these divergent historical and historiographical approaches can contribute to a more thorough analysis and understanding both of the discipline's past and the ways that that past has been represented. I will explore the diverging approaches to the historiography of anthropology promulgated by anthropologists and historians of the human sciences in the context of the discipline in the postwar United States. Emerging from a project examining the connections between Indigenous anthropologists and the development of Native American / Indigenous Studies as an academic discipline in the 1960s and 1970s, it argues that both historiographical approaches are necessary to understand both the particular disciplinary context in which these scholars were trained and the wider intellectual and political contexts in which they were working. This paper will also contribute to wider conversations about the expansion of methodologies and approaches to the history of the human sciences by bringing an analysis the work of Indigenous scholars into dialogue with wider historiographical discourses.

Anthropology, Acculturation, and Indigenous Capitalism in the Alaskan Arctic ***Tess Lanzarotta, Denison University***

In 1980, an article titled "Alcohol Plagues Eskimos," appeared on the front page of the New York Times. It reported on a study, conducted by a team composed of a psychiatrist turned anthropologist, a sociologist, and a criminologist, which claimed that seventy-two percent of the adult Iñupiat population of Barrow, Alaska were alcoholics. The researchers attributed this shocking statistic to the development of the Alaskan oil industry. According to the researchers, rapid economic and cultural changes were driving up rates of substance abuse and violence, to the extent that they predicted the "extinction" of the community within thirty years. Understandably, the residents of Barrow were outraged by these claims. In subsequent years, politicians, policymakers, and scholars from a range of disciplines pointed out the myriad ethical and methodological shortcomings of the study. Rather than rehashing these criticisms, I use this episode as a point of entry to explore the longer history of arctic anthropology. I particularly focus on the history of anthropological discourses that focus on "acculturation" and its supposed relationship(s) to capitalism. In doing so, I use this paper to question why particular anthropological ideas about the relative "authenticity" of Alaska Native cultures have persisted and explain how they have shaped modes of inquiry across the human sciences. At the same time, this paper will consider more recent critiques of arctic anthropology—from inside and outside the field—and reflect on how these critiques can and should shape historical analyses.

Ethnography's Archival Ethic: Exchanging Fieldnotes in the Harvard Chiapas Project (1957-1980) ***Matthew Watson, Mount Holyoke College***

Perhaps the encounter between historians of anthropology and historians of the human sciences stages a scientific "trading zone" or an anthropological "sphere of exchange." Some U.S. anthropologists, of course, have long professed their discipline's deep historical consciousness. Those most inclined to construct the discipline as an "historical science," or a descendent thereof, may profess attachment to the Columbia School of Anthropology's documentary impulse: reducing, by inscribing, the lifeways of ostensibly-imperiled Indigenous cultures. Threads of this documentarian sensibility persisted into scenes of midcentury social scientific modernism. But the threads were tangled by three entwined post-War developments: anthropology's demographic growth; intensified state funding of social science; and the corollary rise of deep-pocketed collaborative research projects. This paper argues that these knotty developments prompted anthropology to shift from a documentary aesthetic to an archival ethic. Anthropologists who once constructed ethnographic documents as artifacts of vanishing worlds reconstructed them as contributions to a corpus that evidenced the multiplicity of enduring ways that cultures fashioned their humanity. I develop this thesis through a reading of the archival sensibility of the Harvard Chiapas Project (1957-1980), a long-term research collaboration and field school. Chiapas Project instructors' ethnographic methods training emphasized how fieldwork, followed by the exchange of fieldnotes, yielded an ever-thickening archival account of lifeways in Zinacantán, Mexico. The paper drives toward paired historical and historiographical questions: how did the introduction of the personal computer, contemporaneous with the Chiapas Project's end, interrupt ethnography's archival ethic; and might the history of the human sciences help anthropologists appreciate how midcentury collaborations have shaped the field's intellectual and social formations?

Situating the History of Anthropology in the History of Science Collections at the American Philosophical Society ***Adrianna Link, American Philosophical Society***

Institutional histories and the histories of collections and collecting remain essential components of work in the history of anthropology and the history of the human sciences more generally. Taking as its example the scientific and anthropological materials held in the archives at the American Philosophical Society (APS) in Philadelphia, this paper explores the history and parallel growth of these collections during the mid-20th century in order to consider the ways in which they inform one another in the present. Specifically, it shows how the emergence of history of anthropology as a distinct disciplinary subfield coincided with the Society's efforts to launch a dedicated program for the history of science during the 1960s. Conceived by historian of medicine Richard Shryock (who served as APS librarian from 1959 until 1966), the APS's program in the history of science focused on the collection of scientific publications, manuscripts, and other materials that documented American science. Yet in Shryock's view, comprehensive histories of science also required understanding the social and cultural circumstances that shaped the formation and circulation of new ideas; he therefore considered the human sciences and especially anthropology a critical part of the APS's program. By situating the formation of the APS's anthropological collections within this context, this case contributes to discussions that cut across histories of anthropology and the human sciences and highlights the role of archives and libraries in the establishment of new scientific and historical fields as well as their ongoing responsibility to pursue the ethical stewardship of their holdings.

Session Organizer:
Robert Hancock, University of Victoria
Chair:
Judith Kaplan, Science History Institute

063. Mineral Economies and Critical Minerals: The Science and Politics of Resource Designations
Organized Session
10:00 to 11:30 am, Friday 8 Nov.
Fiesta Americana: Lobby Level - Yucatan III

Contemporary discourse surrounding critical minerals often separates issues of science and societal significance. However, the terms by which mineral resources are delineated—e.g., "rare," "strategic," "precious," "critical"—are neither mere description nor politically neutral. Instead, the meaning and significance of these terms have shifted over time alongside broader changes in knowledge and political

economy. This panel historicizes the origins of key mineral designations. Each paper interrogates the historical relationship between the political economies of mineral commodities and the sciences of mineral classification and extraction. Focusing on different commodities—gems, copper, rare earths, iron, and coal—the panelists ask when, where, and why knowledge of minerals becomes valuable? How do minerals become abstracted and universalized as both resources and scientific categories? And how do these categories influence one another? By examining the processes of negotiation and calculation behind the assigning of value to the earth, these papers demonstrate how societal and political circumstances have shaped the process of mineral designation. Historical scholarship has often limited discussion of "critical" minerals to the war-time shortages and politically induced supply disruptions of the twentieth and twenty-first centuries. This panel explores earlier histories and genealogies from the seventeenth to the late nineteenth century, from colonial expansion and commercial ventures to chemistry textbooks and scientific conferences. By situating minerals at the confluence of science, commerce, and the state, this panel argues for a deeper historicizing of the terms underpinning the policies governing resource extraction in the present and future.

Participants:

Finding Common Ground: The Indian Ocean Gem Trade and the Making of the Early Modern Globe c. 1600-1750 ***Claire Conklin Sabel, University of Pennsylvania***

This paper argues that precious stones are as central to the history of the early modern earth sciences as fossils. If organic remains illuminated the problem of time, as a rich scholarship on 17th and 18th century geology has shown, then gems drew attention to the problem of space. Among the most site-specific mineral commodities of the early modern world, precious stones presented a problem for theories of universal earth processes: why did some gems, such as diamonds, only form in certain geographical locations, while precious metals were found everywhere in the world? This was a distinctly early modern concern: before diamonds were discovered in Brazil in the 1720s, there were only two known diamond localities in the early modern world: in the Deccan region of South Asia, and in parts of western and southern Borneo. As new maritime networks of the Dutch and English East India Companies facilitated direct connections between Indian Ocean gem localities and European naturalists for the first time, jewelers and gem merchants began to travel these routes. They furnished specimens, samples of earth, and travel reports that were widely used by European scholars to develop accounts of the material structure of the earth that enabled such mineral formation. While much of the long-distance travel within the gem trade went from Europe to the Indian Ocean, and back again, these exchanges were never one-sided. Geographical and geological information moved in both directions across Eurasian trade routes during the long seventeenth century. This led to a broadly cross-cultural understanding of the material composition of the globe, derived from localized commercial relationships and mineral commodities, but critical for the emergence and influence of the earth as an object of scientific inquiry.

Critical Metal: Science and Copper in the Making of the Early Modern French Empire ***Armel Cornu, Uppsala University***

My paper examines the role of scientific knowledge in shaping the mineral policies of the eighteenth-century French state. France attempted to supply its expanding colonial empire with copper, a metal that it came to describe as "critical" to its imperial and war ambitions. Intersecting social history and the history of science, my paper connects copper mining and the Atlantic trade, showing the political and economic underpinning of critical mineral acquisition. The search for copper was an animating force of the growing French empire. Copper was in demand for a variety of products from luxury goods to instruments, but the largest application was support for imperial expansion, as copper was used in sugar refining, on the hull of ships headed for warmer waters, and as currency used for the purchase of enslaved Africans. In the aftermath of the Seven Years War, the French kingdom reoriented its efforts towards its remaining island colonies. Lacking mineral resources on its own soil, France enacted trade agreements, becoming the leading client for Swedish copper. Both countries collaborated and competed in applying their knowledge of mining and metallurgy. The French revolution and subsequent breakdown of trade once again made France's lack of copper apparent. Its defenders instead applied scientific knowledge to the utilisation of France's meagre copper resources, in desperate times attempting to "convert church bells into canons." By examining the evolving role of scientific knowledge in the recurring struggle of the

French Empire to secure copper resources, my paper critically examines the creation of discourse surrounding the search for “critical” minerals in the early modern period, outlining its political and colonial outcomes.

Critical Minerals and the International Geological Congress, 1875–1913 ***Gustave Lester***

The origins of the term “critical minerals” is usually tied to the geopolitical and geological discourse surrounding metal shortages during the World Wars. This paper offers a deeper historicizing of the term by examining the professional discourse and products of the International Geological Congress (IGC). It draws on the published and archival documents of key meetings of the IGC between the 1870s and 1913, culminating with their publication of ambitious surveys of global iron and coal deposits. I argue that from its initial organizing efforts in Buffalo, New York to massive collaborations in Stockholm and Toronto on the eve of the First World War, the membership of the IGC played a key role in delineating the terms of critical mineral frontiers. Moreover, I contend that the IGC’s early concern with industrial raw material supplies reflects the longstanding disciplinary commitments of state sciences to being tools of geopolitical calculation. By diving into the records of the early IGC, this paper aims to contribute to our understanding of how scientific organizations have shaped the language and landscapes of modern extractive regimes.

“Neither Rare, nor Earths”: Origins of an Ambiguous Name ***Charlotte Abney Salomon, Science History Institute***

This talk examines the history of the term “rare earth” as a category of chemical elements and its implication that the metals themselves are rare. As many rare earth elements are critical for the manufacture of electronic devices, the supply chains for these metals are the subject of government policy, industrial endeavors, and regular media coverage. Publications in all three categories frequently note that despite their name, rare earths are in fact relatively abundant and widely distributed metals, suggesting that the term itself merits correction before these issues can be analyzed. The origins of the term are traced in this talk through the intersecting and successive developments of early nineteenth-century nomenclature, the adoption of the periodic system, and the much more recent industrial demand under which many of them came to be considered essential to modern life. Over the course of two centuries, it is clear that the term has always been non-literal, flexible, and unstable, often reflecting persisting ideas about the elements that were already outdated by the time each word came into use.

Session Organizer:

Armel Cornu, Uppsala University

Chair:

Pratik Chakrabarti, University of Houston

064. Medicine across Borders: Decolonizing the History of Medicine in 20th-Century Asia

Organized Session

10:00 to 11:30 am, Friday 8 Nov.

Fiesta Americana: Lobby Level - Yucatan IV

The history of medicine in 20th-century Asia contributes to decolonizing both academia and activism. Thinking with liminality, this panel interrogates the notion of (post)colonialism to reframe the global history of medicine. In the liminal spaces between communities in transition, boundary-making in imagined frontiers and borderlands, and grappling with the indelible effects of state formation, the four papers of this panel span imperial networks between the United States and East, Southeast, and South Asia and employ both archival and ethnographic methods. They speak to both historiographical continuities in recovering the agency of marginalized actors, as well as theoretical ruptures in decolonization, subjecthood, and knowledge production. In listening for deliberate silences as much as for affirmations of self and space, this panel provides theoretical frameworks for decolonizing the history of science that can be useful across disciplines and subject areas. First, Adrien Gau connects contemporary transgender politics in Taiwan, post-WWII American science diplomacy and innovations in plastic surgery, and legacies of Japanese colonialism. Second, Shinyi Hsieh follows the transformation of Taiwan as an imagined frontier for US naval experimentation on tropical diseases and epidemiology during the Cold War into a model for American expansion into Southeast Asia. Third, Gideon Lasco proposes a new history of healthcare activism against the Marcos dictatorship in the Philippines that highlights intersectional community alliances, traditional and alternative healing traditions, and the local reimagining of the aspirations of international health. Lastly, Ngamlienlal Kipgen explores the silences in the archives of the borderlands of Northeast India through the hauntings of medical imperialism and the specters of American military experimentation during World War II. Fa-ti Fan serves as the chair. The Forum on History of Science

in Asia sponsors this panel.

Participants:

Legacies of Imperialism in Transgender Plastic Surgery in Taiwan ***Adrien Gau, University of Pennsylvania***

Although Taiwan is widely celebrated for both its extensive nationalized healthcare insurance (NHI) program and its queer-friendly political climate, Taiwan's NHI also mostly does not include transgender medicine, because gender-affirming surgeries are performed by cosmetic surgery clinics. In this way, the transgender community in Taipei, although heterogenous in origin and desires, collectively fall into the cracks between citizenship, self-actualization, and a global exchange of gender(ed) norms and pursuits of health. I argue that these issues of contemporary trans politics and healthcare in Taiwan are inextricable from a historical combination of developments in US military medicine and Cold War diplomacy in Taiwan throughout the second half of the twentieth century, alongside the colonial structures that Japan left behind of medical and anthropological education. As such, this paper reconceptualizes the notion of postcolonialism, in light of the intersection of settler colonialism and cultural imperialism in 20th-century Taiwan. Moreover, while biomedicine broadly gains its authority over social issues through its assertion of objectivity and scientific expertise, the Taiwanese categorization of gender-affirming surgeries as cosmetic serves discursively to both privatize and denaturalize the role of medicine in trans selfhood. Trans bodies, then, become the liminal material upon which surgery and the state inscribe new meanings and contest other ways of knowing and being.

From Frontier to Base: Taiwan's Transformation in NAMRU-2's Geomedical Expansion in Southeast Asia (1950s-1970s) ***Shinyi Hsieh, Harvard University***

From 1955 to 1979, the U.S. Naval Medical Research Unit Two (NAMRU-2) was reactivated in Taiwan, tasked with safeguarding the U.S. military and combating "Asian" diseases. Grounded in recent reflections on liminality and its potential for decolonization, this article examines Taiwan's changing position across the regional boundaries between East and Southeast Asia. Through close examination of declassified institutional archives in the U.S. and Taiwan, this article illuminates Taiwan's liminality. It challenges the glorification of mei-yuan/USAID era in postwar Taiwan and the conventional assumption of placing Taiwan within Sinological Circle in existing historiography. Started from 1958, NAMRU-2 launched a series of fieldwork on tropical diseases and animal collections, responding to epidemics including cholera and malaria in Thailand, Vietnam, the Philippines, and British North Borneo (current Sabah). The paper argues that during this period, Taiwan transitioned from the frontier to a logistic base of NAMRU-2's geomedical expansion in Southeast Asia, paving the way for NAMRU-2 to shift its focus to research detachments in Vietnam, Indonesia, and the Philippines. This transformation was influenced by NAMRU-2's engagement in a series of conflicts, including the Cold War, Vietnam War, and campaigns against Asian tropical diseases. NAMRU-2 utilized modern laboratory facilities and local labor in Taiwan, affording greater flexibility in studying Southeast Asia. The liminality of Taiwan within the geomedical mission of NAMRU-2 reveals power imbalances surrounding the accumulation and centralization of research materials and scientific credits, as well as disparities in the preservation of archival records primarily within the United States.

"Health in the Hands of the People": People's Health Movements in the Philippines (1972-1992) ***Gideon Lasco, Harvard University***

Much has been written about the underground movements that challenged the Marcos dictatorship (1972-1986) and US imperialism, particularly the rise of the Communist Party of the Philippines. However, there have been very few surviving accounts of how health advocacy and activism were part of these movements; how they constituted distinct movements in their own rights; and how they were shaped by - and also shaped - regional and global health currents. This paper presents a historical overview of the people's health movements in the Philippines during the Marcos dictatorship and its aftermath, and how a disparate range of actors - from Catholic nuns to elite physicians - sought not just to challenge the dictatorship but to decolonize medicine in the country, in ways that predated and even inspired the Alma Ata Declaration in 1978. Emphasizing a community-based approach and embracing indigenous medical traditions and alternative ones like herbal medicine and acupuncture, these movements would outlive the dictatorship and leave an indelible mark in the Philippine

health care system, posing a counter-narrative to the international health regime in the 20th century. In rendering this history visible, I likewise present a counter-narrative to the historiography of medicine in the Philippines, which has mainly been framed along (post)colonial rubrics and focused on physicians at the expense of many other agents of reform, resistance, and change.

Spectral Silences: Navigating U.S. Medical Military Missions in Northeast Indian Borderlands (1940-1950) ***Ngamlienlal Kipgen***

How does the archive manifest itself across geographies and temporalities? In what way can we retrace the past when we are met with silences? In this paper, I present a case study of Margherita town of Assam, India which was the site of a US medical military intervention during the Second World War. This intervention came in the form of a hospital that aided the construction of a supply line called Stillwell Road. The medical military mission was not only preoccupied with care work but was also striving to ensure the boundaries of American imperial influence. The paper examines the archival sources that reproduce imperial legacies of grandeur but also sheds light on the haunting silences within the site. As haunting raises spectres, this paper explores the various spectres of war from medical experimentation to exploitation and extraction to re-examine how we could re-employ the archive. I show how ethnographic encounters and interdisciplinary approaches to Northeast India, as well as mutable objects such as the border, become essential in decolonizing the archive as well as remodel the way we approach historical work in sites marginalized by history and the State.

Session Organizer:
Adrien Gau, University of Pennsylvania

Chair:
Fa-ti Fan, Binghamton University

065. Making Arguments in the History of Science

Contributed Paper Session
12:00 to 1:30 pm, Friday 8 Nov.
Fiesta Americana: 1st Floor - Izamal I

Participants:

Radical Science in Britain: Towards a Conceptual History of Luddism ***Claire Ann Votava, University of California, Los Angeles***

This paper explores resistance as a constructive force in the history of science and technology, with a particular focus on the British Society for Social Responsibility in Science (1960s–1990s). While the BSSRS can be situated within broader movements in nuclear disarmament, environmentalism, and New Left politics, I examine whether the BSSRS can also be understood through the social and conceptual history of Luddism. When the BSSRS was established, numerous distinguished scientists counted among its participants. Members addressed a diverse array of topics, including hazards in the workplace, the democratization of science, and the relationship between science, capitalism, and labor. Scholarship has explored the roots of the radical science movement in the ideologies of British scientists in the 1930s. Recent work has also delved into the 1960s and 70s, exploring radical science groups in Italy and the U.S. Limited attention, however, has been given to the BSSRS itself, and its relationship to techno-scientific critique, including Luddism. While scholars continue to revisit the original Luddites (1810s), few have considered Luddism after the Luddites, despite its persistence as a cultural catch-all. I aim to contribute to burgeoning scholarship which argues that 20th century Luddism moves far beyond opposing technological developments on the factory floor, and emerges as a "collective pseudonym" for techno-scientific discomfort and critique. Thus, I argue that the BSSRS can help to construct a more comprehensive history of Luddism, allowing us to better understand the articulation of anxiety in the midst of technological and scientific change, and imagined alternatives.

Soft Demarcation ***Erika Lorraine Milam, Princeton University***

If "hard" demarcation is the process of creating a bright philosophical line between science and not-science (perhaps even pseudo-science), this talk explores the related phenomenon of "soft" demarcation, or the processes by which scientists decide what research questions and approaches are core to their field and which are peripheral. Like hard demarcation, the processes of soft demarcation are necessary to academic science. They allow the scientific community to collectively attend to emerging areas of research, move on from stale debates, and focus the brain power of a field in a few select directions. Three examples serve to demonstrate the intertwined nature of hard and soft demarcation: the intellectual politics of organismal biology in the 1960s, the influx of women into anthropology in the 1960s and '70s, and more recently biologists' appeals to

scholars in the humanistic study of the sciences to seek alternative legitimation of their ideas. The logic of soft demarcation functions through judgements of excellence and the status of knowledge, Milam contends, which in turn can exacerbate discrimination by rendering it rhetorically justifiable. By attending to soft demarcation as a process, historians of science can more thoughtfully reflect on not just the boundaries of science but also the dynamics of prestige that define its intellectual core.

From Biological Rhythms to Biorhythms: Genesis of a Pseudoscience ***Jole Shackelford, University of Minnesota***

George Thommen's 1964 book Is this Your Day? introduced biorhythms, a Swiss-German pseudoscience, to the American consumer at a time when claims for popular science, alternative science, and the paranormal were capturing the public's interest. In the ensuing decades the computer-generated and plotted biorhythm charts he sold in collaboration with his acolyte Bernard Gittelson joined the brain-wave feedback devices and negative-ion generators that appealed to a generation bombarded with scientific novelties and do-it-yourself gimmicks for improving one's health, sex life, and job performance. The basic premise of biorhythms is that each of us experience fluctuations in our physical, emotional, and intellectual states that follow sinusoidal patterns of waxing and waning, measured from the moment of our birth (sin(0)=0); the physical varying with a 23-day period, the emotional with a 28-day, and the intellectual with a 33-day. Various alignments and trends of these harmonic factors mark "critical days," during which we are particularly liable to successes or failures. But it was not always so. Biorhythms was built on a theory of the rhythmic nature of living substance expounded by Wilhelm Fliess, a one-time friend and confidant of Sigmund Freud, and this theory was within the realm of credible biological speculation about the nature of life at the turn of the century. This presentation will explore the historical process and intervening actors who willy-nilly transmuted Fliess' theory into a pseudoscience.

Abstract Arguments: How Claims Are Made in the History of Science ***Jonny Bunning, École des Hautes Études en Sciences Sociales***

The historiography of science usually means doing one or more of three things: talking about the big names of the past, lamenting the state of the field in the present, exhorting to do something different in the future. But what kinds of claims do most contemporary historians of science actually make in their published works? Using article abstracts from Isis, I investigate what arguments have been made about what topics in the discipline over the past 27 years. First appearing in the journal (apparently without fanfare) in 1997, abstracts help reveal patterns of argument, content, and method that are not visible when focusing on a clutch of canonized papers or authors; they also suggest that the history of science is more conservative than usually assumed. I offer some possible causes and implications of these results. Isis may not be representative of the entire field, and abstracts may not always accurately reflect article contents, but studying the journal's abstracts offers a way to understand the claims actually made in the history of science and how they change — or not.

Chair:

Aaron Mendon-Plasek, Purdue University

066. New Directions in Medieval and Early Modern Science

Contributed Paper Session
12:00 to 1:30 pm, Friday 8 Nov.
Fiesta Americana: 1st Floor - Izamal II

Participants:

Knowing and Working with the Seasons in a Persian Agricultural Text (c. 1311 CE) ***Riaz Howey, Max Planck Institute for the History of Science***

While Medieval agricultural-scientific texts rarely engage with topics like defining or explaining the causes of seasons, associated with fields like astronomy, the practical farming knowledge they present is however invariably calibrated to the seasons. This paper focuses on seasons in New Persian-language texts on agriculture, with a focus on Mongol Empire-era Iran. With a ruling class following pastoral rhythms, regulating economic life according to climate patterns was an evolving issue cutting across social and cultural lines. The period also saw movements of texts, plants, people and entire farming systems into unfamiliar lands with new climatic and seasonal coordinates. Contextualised in Islamic agricultural-scientific literature and social history sources from the period, I will focus on Rashīd al-Dīn Hamadānī's Persian-language agricultural text from c. 1311 CE (710 H). While the initial chapter, on seasons and climates, from his

agricultural text is non-extant, there is a sustained engagement with seasons throughout the extant chapters. Two themes explored are time-keeping in different places using certain plants, famously melons, with reliable responses to seasons and, secondly, harnessing and mitigating the impacts of seasons through technological artefacts, especially in relation to water control and non-human life-cycles. Empirical examples are brought into conversation with questions around the relationship between knowledge and practitioners. The discussion is then connected to the interest from the very beginnings of the HSS with including Islamic and agricultural texts within the emerging history of science.

The Role of Royal Tombs in the Adoption and Dissemination of Waterwheels in Chosŏn Korea ***Jungrim Lee, Seoul National University***

This study examines the introduction and dissemination of the waterwheel in eighteenth-century Korea. The development of this technology was not solely aimed at enhancing productivity, but also at strengthening Confucian ideology for national reconstruction. The introduction of new technologies was more feasible in royal tombs, which were symbolic spaces of the state's power and ideology, than in other areas. The waterwheel was introduced experimentally to manage the grass covering royal tombs and received high praise from kings and scholar-officials. It integrated successfully into routine maintenance practices. The state allocated the finest materials and most skilled artisans for the construction and maintenance of royal tombs, and applied similar standards to the production and maintenance of waterwheels. The kings supported this endeavor, recognizing that any harm to their predecessors' tombs could tarnish their own legitimacy. Unlike in royal tombs, waterwheels were not successfully implemented in agriculture, despite repeated government efforts. Common peasants were hesitant to adopt this unfamiliar technology, primarily due to a lack of resources for its maintenance. Ultimately, the adoption of the new technology was driven by the state's ideological needs. This case demonstrates how Confucian ideology, particularly the virtue of filial piety, facilitated the adoption of new technology in public works, where such ideologies were prominently reflected.

From Gilead to Peru: Balsam in Early Modern Medicine and Alchemy ***Elisabeth Moreau, University of Cambridge***

In early modern pharmacology, physicians discussed the properties and provenance of simple drugs in reference to the ancient sources of materia medica. In this paper, I will examine the case of balsam, which could designate an exotic vegetal ingredient, a fine oil obtained by distillation, or the Paracelsian notion of vital principle. To do so, I will envisage a series of medical and alchemical texts that aimed to clarify the nature of balsam and its location in the East (Balsam of Gilead) and West (Balsam of Peru). These debates shed light on the issues of drug adulteration and alternative methods of pharmaceutical production. As will be argued, balsam was a moving ingredient and medical notion that reflected the global circulation of medical knowledge, as well as the colonial context of the pharmaceutical trade. Concurrently, it prompted the emergence of alchemical therapy as a 'balsamic' medicine rooted in biblical times.

André Thevet as an Eyewitness to the Transition from Humanism to Science (1554-1590) ***Seán Thomas Kane, Binghamton University***

The French cosmographer and explorer André Thevet (1516–1590) used his experiences traveling to the Levant and Brazil as the basis for his cosmographic work in his three major books La Cosmographie de Levant (1554), Les Singularitez de la France Antarctique (1557), and La Cosmographie Universelle (1575). In the Singularitez, Thevet observed transformations underway in the Americas which demonstrated the pronounced human impact upon the natural world. This paper describes how Thevet relied on his own eyewitness testimony to craft a travel narrative of the Americas built upon the singularities he observed in Brazil. These singularities challenged established knowledge about how nature ought to function. With Thevet's observations of the three-toed sloth (Bradypus crinitus), toco toucan (Ramphestes toco), and other neotropical animals, one can observe the beginnings of the skepticism of established learning that is attributed to the Scientific Revolution of the seventeenth century beginning a full fifty years earlier in Brazil. While his work was built upon the humanistic tradition of the Renaissance, it speaks towards

the norms and standards of the natural sciences which the historians of science have attributed to later generations in the seventeenth century.

Chair:
Alisha Rankin, Tufts University

067. Asilomar@50: The Past and Future of Public History of Science

"Futures" Roundtables
12:00 to 1:30 pm, Friday 8 Nov.
Holiday Inn: Lobby Level - Maya

In 1975, a group of 140 biologists, policymakers, journalists, and physicians convened the Asilomar Conference on Recombinant DNA to discuss how to proactively manage the risks of new and rapidly accelerating recombinant DNA technology. The conference had a long-lasting impact on how the public perceived scientific research and emerging rDNA technology. It was not a cloistered-away meeting of academics but rather a cross-industry conference where journalists from publications like Nature and Rolling Stone worked alongside scientists and policymakers to collaboratively understand an emerging scientific frontier. The results were two-fold: the conference produced industry safety guidelines for the use of rDNA technology and coverage of the conference in the popular media introduced a broad swath of the American public to the ethics and practices of scientific research. Biotech is booming 50 years later, but a new century brings new questions. Using the 50th Anniversary of the original Asilomar conference as its platform, another interdisciplinary group of experts will convene at the same site in February 2025 to grapple with the history and future of science. This roundtable considers the 1975 and 2025 Asilomar conferences as a case study with implications for the future of our discipline. What lessons did we learn from the 1975 conference that should be used in 2025? Why invite historians of science to an event about emerging biotechnology? What is the role of the historian of science in interpreting current events for the public? How might we leverage new media to make history timely and relevant to the public?

Session Organizer:
Michelle DiMeo, Science History Institute

Chair:
Luis Campos, Rice University

Commentator:
Michelle DiMeo, Science History Institute

Participants:
Elena Conis, University of California, Berkeley
Mariel Carr, Science History Institute
Clay Cansler, Science History Institute
Jeffrey Reznick, National Institute of Health, National Library of Medicine

068. Big Data, Necropolitics, and the Architecture of Technology in the Modern Middle East

Organized Session
12:00 to 1:30 pm, Friday 8 Nov.
Fiesta Americana: Lobby Level - Salon Celestun

Studies of Science and Technology (STS) have come a long way since the Edinburgh School of Science, Society and Knowledge (SSK), offering a critique of what Michel Callon (2001) has called ‘black boxes’ (Fuller, 1999) and interrogating the colonial role of technical expertise in furthering Empire’s objectives, or what Dodge has called “new imperialism, (2007). This panel examines the interplay between technology, colonialism and knowledge production during the long nineteenth century in the modern Middle East. Each paper delves into distinct yet interconnected spheres, shedding light on how various forms of technology shaped and were shaped by colonial ambitions, public health regimes, architectural interventions, and intellectual movements across the Ottoman Empire and beyond. The Herman Hollerith Tabulator, known for its pivotal role in revolutionizing data processing during the 1890 US census, receives renewed scrutiny considering recent scholarship on its dangerous implications. Contrary to prevailing narratives on European prowess, scholars like Edwin Black expose the tabulator's complicity in facilitating the Nazi Holocaust through unprecedented data tabulation capabilities (Black, 2001). In challenging prevailing scholarship, our first paper revisits the tabulator’s earlier dress rehearsal: the 1917 Egyptian census. Tracing the colonial history of Big Data, this paper demonstrates how statistics were wielded to advance British colonial ambitions, from epidemiology to border delineation, underscoring the insidious use of information banks architected by Herman Hollerith’s apparatus. Similarly, the tabulation of the dead and the political economy of corpse traffic echo governmentality via necropolitical framings. Shifting to nineteenth-century Ottoman Iraq, our second paper the nexus of spiritual pilgrimages, pandemics, and public health in the Ottoman Empire dealing with border delineations and the politics of the dead became focal points of geopolitical gravitas aimed at tabulating the living. From the Hajj to Mecca to Shi'i pilgrimages in Najaf and Karbala, politicians and medical experts grappled with controlling the spread of cholera and plague undergirded by Orientalist and colonial discourses aimed at regulating the traffic of corpses. Thus, corpse traffic management illuminates the complex interplay between medical knowledge production, imperial power dynamics, and the manufacturing of subjectivity, revealing how colonial governance operated through the management of life

and death (Mbembe, 2003). Digging into the machinations of bureaucratic technologies, the third paper explores how the Ottoman Customs Administration emerged as a site where architecture served as a technology of the British's informal empire. The construction of custom houses in key ports during the early twentieth century elucidates the instrumentation of architectural technologies to enhance revenue collection and control smuggling. Thus, these processes illuminate the expansionist and coercive dimensions of imperial rule beyond territorial conquests and border articulations. Intricately, the professional journeys of knowledge-producing experts involved in the aforementioned processes, such as Ottoman physicians. Employing a microhistorical approach to evaluating technocratic experts, our last paper closes the panel by offering nsights into the intersections of medicine, nationalism, and intellectual movements during this period. The role of educated elites in producing, reinforcing, pivoting from, or challenging the systems of relational power they were entrusted to maintain elucidated the complexities of technologies of subjectivities. Together, this panel urges a more critical inquiry into technology as a mode of revealing and concealing the interconnected and overlapping relationships between power, knowledge production, innovation, and subjectivity. It prompts a critical reflection on how technology shapes our understanding of society, governance, and knowledge production (Heidegger, 1977) during a transformative period in global history.

Participants:

Big Data before Big Data: 1917 Census Tabulators in Colonial Egypt *Karim Malak, Wagner College*

The Herman Hollerith Tabulator, the predecessor to the computer, was essential to the 1890 US census. Turning years of manual tabulation into weeks, the tabulator is normally celebrated as a European and governmental technology. Recent scholars such as Edwin Black have shown the dark side of the tabulator, and how it was essential to the Nazi Holocaust because of its ability to tabulate information on a new scale and produce new categories. This is what allows Black (2001), to argue that the Nazi census of 1933 was the 'dress rehearsal' to the 1935 US Social Security Administration, which for the first time utilized tabulators to create individual files on US citizens. This paper challenges this claim and looks to an older dress rehearsal: the 1917 Egyptian census. By following the head statistician of the Census Bureau, it offers a history of how statistics, their collection and processing, worked to advance British colonial goals. Putting statistics in the service of epidemiology, craniology, border delineation, hydrography of the Nile and demography, the 1917 Census Bureau chief catapulted himself into the upper echelons of the Egyptian state while advancing British interests. This he did first through the census. As the largest client of the predecessor of IBM, the British organized colonial census of Egypt used new categories. Using tabulators, the census tracked the number of able-bodied citizens and cross-referenced them with their race, ethnicity and religion. Thus this paper offers a colonial history of Big Data and offers a colonial genealogy of modern censing techniques outside of Europe drawing on the example of colonial Egypt. Revisiting Ian Hacking's claim that statistics produced an "avalanche of data" that was useless (Hacking, 1991), this paper shows how information was put to insidious colonial use, thanks to the Herman Hollerith Tabulator.

Pilgrims, Corpses, and Pandemics: Nineteenth Century Ottoman Iraq and the Birth of the Global Public Health Regime *Zeinab Azarbadegan, Oxford University*

Muslim pilgrimages, such as the Hajj to Mecca in Ottoman Arabia and the Shi'i ones to Najaf and Karbala in Ottoman Iraq, were the main preoccupation of politicians and medical experts in their attempts to control the spread of cholera and plague pandemics in the nineteenth century. With the birth of the global public health regime embodied in the International Sanitary Conferences in the mid-century, the Ottoman Empire came under evermore international scrutiny in managing the spread of pandemic diseases in times and places of pilgrimage. Since the fourth International Sanitary Conference in Istanbul in 1866, regulating the traffic of dead bodies to Ottoman Iraq became an international preoccupation, bringing the Qajars in Iran into these discussions. Corpse traffic was a common and long-standing Shi'i practice, where the faithful transported the bodies of their dead to be buried inside or near the shrines in Ottoman Iraq. This paper examines the global and local attempts at regulating corpse traffic, focusing on the debates among medical experts to show how medical knowledge production was informed by Orientalist and colonial discourses, ascribing the malaise of the diseased bodies to the body politics of the Ottoman and Qajar states.

Centering Ottoman, Persian, and Arabic sources, this paper argues that the dead body was ascribed different legal, class, and religious identities in order to justify and facilitate more control and integration over Ottoman Iraq by the Ottomans, the Qajars, and the European Great Powers.

Building the Ottoman Customs Administration: Architecture as a Technology of British Informal Empire 1906-1911 ***Yara Saqfalhait, Columbia University***

In 1909, the Ottoman government appointed the British commissioner of customs Richard Crawford as a consultant to its internal revenues administration, tasking him with reorganizing its customs service to increase revenue and control smuggling. The ensuing reforms materialized in building new custom houses in the ports of Istanbul, Izmir, Salonica, Beirut and Haifa, among others, consolidating previously scattered facilities of the customs administration into a central structure in each port. In particular, architecture was meant to solve two major problems; minimizing commodity clearance time and enforcing means for the chemical inspection of goods through the introduction of dedicated laboratories. These reforms were part of broader contemporaneous British involvement in reorganizing customs services across East Asia and the Middle East. By focusing on the construction and operation of Ottoman custom houses on the eastern Mediterranean coast of the empire during the first two decades of the twentieth century, this paper investigates the central role of architecture as a technology of British informal empire within Ottoman dominions. In doing so, I combine theoretical frameworks from scholarship on informal British empire (Gallagher and Robinson, 1953) and markets as calculative devices (Callon and Muniesa) together with architectural histories of empire (Çelik, 2008; Christensen 2017) to argue that architecture was deployed for expansionist and coercive ends not only in its more readily recognized imperialist manifestations in the form of military barracks and government palaces, but also where imperial rule didn't command territory and sought to control commodity flows.

Doctored Horizons: A Microhistory of a Medical Nahdawi ***Sara Farhan, University of Northern British Columbia***

The 1911 play Lahjat al-Abṭal [Heroic Argot] is considered to be the genesis of poetic theatre in modern Iraq. Written by the Ottoman physician Sulayman Ghazala the play narrates an epic struggle between an educated cadre "under slavery, exposed to all sorts of calamities" who revolted against authoritarianism and tradition. The climax of the play is reached when the protagonists, "liberal-minded young men, came together to break the yoke," and achieve a "… victory for the Ottoman Empire" as "Sultan Muhammad al-Rashad [V] takes the throne of the caliphate" and placates the CUP. Born during the Tanzimat to a prominent Christian Baghdadi family, Ghazala apprenticed under the Dominican Order in Mosul; traveled to Beirut to study at the Syrian Protestant College; then to Paris to work on a medical thesis in 1886 titled "Sur la cause de la mort naturelle ou physiologique." He returned to Istanbul and was assigned to be a Sanitation Conference Delegate on behalf of the Empire when cholera and the plague reached pandemic status. Assigned to Tripoli, Libya until the Italian invasion, Ghazala returned to Baghdad during World War One eager to participate in post-war nation-building. As a physician, Ghazala contended that he and his professional class compatriots were the solution to imperial decay. The life and times of Ghazala evidence that those "liberal-minded young men" were in fact the author and his class compatriots. Revolutionary mottos are then the Heroic Argot, i.e. the common parlance amongst the educated protagonists. While Iraqi scholarship asserts Ghazala as a pioneer in poetic theatre, little is known about his scientific and medical literary works which engage with and advance the tenets of al-Nahda. Ghazala's medical research, history of medicine texts, and translations produced and reproduced vibrant engagements with international networks while positioning Arab medical experts as both the descendants of a long history of medical and scientific innovation, as well as contributors to novel and cutting-edge medical research. This paper offers a microhistorical approach to the study of scientific knowledge production and reproduction during al-Nahda through an analysis of Sulayman Ghazala's professional journey, his work on the history of medicine in the Arab world, and his scientific and medical research. Ghazala was part of a burgeoning professional class with membership in regional and international organizations.

Session Organizer:
Karim Malak, Wagner College

Chair:

Sara Farhan, University of Northern British Columbia

Commentator:

Sohini Chattopadhyay, Union College

069. Producing the Ground: Technoscientific Makings and Unmakings of Land across the Global South

Organized Session

12:00 to 1:30 pm, Friday 8 Nov.

Fiesta Americana: Lobby Level - Salon Mérida

Examining land not as a self-evident object but as a complex discursive and material construct, this panel interrogates the history of environmental sciences (agricultural science, cartography, mining engineering) and their role in the active making and unmaking of specific land formations and imaginaries across sites in the global south. Recognizing that "land" is always an assemblage of heterogeneous elements, including material substances, technologies, discourses, and practices (Blomley 2013; Li 2007; Mitchell 2002), we explore the histories that have made various kinds of ground possible today. Building on the work of authors who have studied the making of land as a ground for advancing imperial, nationalist, and economic ideologies (McCook 2002; Schiebinger 2004), a political instrument to assert identity claims (Soto Laveaga 2009; Boyer 2015; Leal 2020), and acknowledging the need to work against the presumed universality and homogeneity of land (Ingold 2012), this panel dwells on the technoscientific practices through which the ground gets produced across sites. The panelists build on this scholarship to analyze the historical processes that have rendered the ground legible as a scientific object to further consider the implications of these changes for the emergence of new political horizons (Petryna 2022). Furthermore, presenters reflect on the utility of studying the making of the ground as an essential analytical move to think about the production of knowledge and its capacity to bring about socioecological transformations. Working across different locations and temporalities, this panel reconsiders the importance of documenting indigenous practices in challenging the coloniality of traditional accounts of land

Participants:

Enduring Hacienda Plantation Logics: Epistemic Violence of Hacienda Plantation and the Emergence of Subterranean Sovereignty
Pablo Aguilera Del Castillo, University of Pennsylvania

After 300 years of colonialism and 200 years of state-making efforts to create a national territory, Yucatán remains a vibrant indigenous territory but also a site of thriving agroindustrial capitalism. After centuries of transformation, the influential haciendas or Yucatec plantations switched from producing sugarcane and corn in colonial times to producing henequen (Agave fourcroydes) from 1850 to 1940 (Bracamonte & Sosa 2007). Now, these haciendas are abandoned, and their land has become a matter of concern for many Yucatecans who see in these spaces "ontological openings" (de la Cadena 2017) to reclaim their land as more than a colonial assemblage. Today, the traditional hacienda's logic, which rendered the Yucatec territory into a simple and homogenous surface (Ingold 2015) for the development of industrial pig and chicken farms, has been contested by the work of a number of water chemists, speleologists, geomorphologists, and lawyers who have found in this Karstic geography full of caves and sinkholes a new subterranean territory with its own "politics of verticality" (Weizman 2002). Through local cave museums, eco-tourism sites, and water quality testing programs, experts are developing new subterranean expertise contesting colonial understandings of land as a mere extension of the enduring logics and epistemes of the old plantations (Thomas 2019). Based on ongoing fieldwork, in this paper, I examine how colonial land perceptions get transformed into new understandings of the subterranean as a new territory and as a new form of local sovereignty

Shifting Grounds of Agricultural Knowledges: Bat Guano, Microorganisms, and Soil Health
Danhue J. Kim, Massachusetts Institute of Technology

In Ratchaburi Province, Thailand, there is a cave inhabited by over a million Asian wrinkle-lipped bats (chaerephon plicatus), where upwards of 7,000 kilograms of bat excrement, or guano, has been mined every week to be sold as fertiliser for the last five decades. Intersecting the history of increased guano marketisation from the 1980s is the emergence of the bat conservation program, the fluctuating chaerephon plicatus population and expanded agricultural research in Thailand following the Green Revolution. This has placed the cave as a site of contested mediation between the Royal Forest Department, conservation scientists, farmers, and guano collectors. My paper recounts how the cave's shifting grounds, filled with excrement, microorganisms, and chitin, became a proxy for fostering soil health through agricultural experimentation and local

knowledge production of guano's potency as fertiliser. I trace the negotiation between agricultural knowledges with conservation projects and local economic needs to shed light on the historical and socioecological dimensions of agricultural science and resource extraction in the region. Refracting this through decolonial approaches, I argue that the 'expertise' on soil health and guano mining sustainability has to be understood beyond the narrow Eurocentric, Enlightenment-made scientific expertise. Today, the negotiation continues, with emphasis on organic fertilisers as part of sustainable agriculture, integration of microbiology in soil science, fluctuating bat population, and continued impetus for profit from guano sales, which uneasily coexist with the low-wage, arduous labour of the guano collectors. Ultimately, I examine the historical scientific knowledge contestation through the present integration of microbiological analysis of bat guano into local agricultural knowledge in Ratchaburi as a way to reflect on how to foresee a more equitable and sustainable future within the grounds saturated with excrement and life

"On the Ground": Ambivalent Affects in the Transnational Making of Agronomic Experts in Mexico ***Montserrat Perez Castro Perez, Dartmouth College***

Controversies associated with oil palm cultivation have prompted the food industry to implement corporate sustainability initiatives "on the ground" to manage the socio-environmental risks of their palm oil supply chains. In this paper, I follow the work of field technicians of corporate sustainability projects in Mexico's palm oil value chain as part of a transnational history of agronomy knowledge and politics. I attend to the idea of field technicians as "on the ground" workers and experts based on multi-sited ethnographic fieldwork with agronomists working with national, transnational, and social companies and NGOs in oil palm plantations in Chiapas, Mexico. I show how technicians' relation to "the field" generates ambivalent affects with the value of their "technical" expertise, hierarchies of labor in the supply chain, and their imagining of current and future socioecological change. I dialogue with the work of intellectual historians and science and technology scholars on the diversity of techno-scientific and political legacies of agronomy in Mexico, to theorize the ethical-political potential, and limits, of the labor of field technicians. I argue that a transnational yet situated and affective perspective of agronomic knowledge allows us to: 1) critically address the imaginary of the plantation as the "on the ground" location where socioecological transformation is known and happens; 2) recognize ambivalent affects to understand the political in diverse histories of knowledge, technology, and labor in a scientific discipline and 3) its potential to rethink the "on the ground" ethics in the planetary transformation

"Make Mercury History"?: Itineraries of Mining and Metallurgic Expertise in the Americas ***Sebastian Rubiano-Galvis, University of San Francisco***

Mercury amalgamation is a technique that has been used for over four centuries to extract silver and gold from ore. It helped sustain the Spanish imperial economy in the Americas by enabling large-scale silver extraction from conquered territories (Guerrero 2017, Bigelow 2020). Later on, it catalyzed nation-building processes based on the gold mining rents left by British and American companies in countries like Colombia and Peru (Rubiano-Galvis, Goldstein, and Diaz 2023). However, the use of mercury in artisanal and small-scale gold mining has become a global concern due to its environmental and health impacts. As a result, a global network of expertise and technical assistance projects sponsored by the UN, aid agencies, consultants, and government officers in more than 80 countries in Latin America, Asia, and Africa have attempted to phase out this practice with mixed results (UNEP 2022). Based on ongoing archival research and secondary source analysis, this paper traces the 'itineraries of expertise' (Chastain and Lorek 2020) of the colonial, corporate, and state apparatus that made the vast expansion of mercury amalgamation in South American mining possible and that now attempts to phase it out. By following the pathways of people, expertise, and artifacts used in the amalgamation process to mine silver and then gold in Colombia and Peru between the 19th and late 20th century, the paper redirects attention to the "on the ground" practices that made mercury amalgamation such a powerful technology. It furthermore highlights its critical role in producing some of the same mining landscapes that are now deemed sacrifice zones or sites of unruly extraction needing intervention in the name of global environmental health. I contend that the UN's aspiration to create a mercury-free world

overlooks the untold histories of the mercury amalgamation process itinerary

Session Organizers:
Pablo Aguilera Del Castillo, University of Pennsylvania
Jaime Landinez Aceros, Stanford University

Chair:
Angélica Márquez-Osuna, Harvard University

070. Osiris Vol. 39: Disability and the History of Science

Roundtable
12:00 to 1:30 pm, Friday 8 Nov.
Holiday Inn: Lobby Level - San Jacinto

Disability has been a central—if unacknowledged—force in the history of science, as in the scientific disciplines. Across historical epistemology and laboratory research, disability has been “good to think with”: an object of investigation made to yield generalizable truths. Yet disability is rarely imagined to be the source of expertise, especially the kind of expertise that produces (rational, neutral, universal) scientific knowledge. This volume of Osiris places disability history and the history of science in conversation to foreground disability epistemologies, disabled scientists, and disability sciencing (engagement with scientific tools and processes). Looking beyond paradigms of medicalization and industrialization, the volume authors also examine knowledge production about disability from the ancient world to the present in fields ranging from mathematics to the social sciences, resulting in groundbreaking histories of taken-for-granted terms such as impairment, infirmity, epidemics, and shōgai. This roundtable will feature the editors and several authors of the volume.

Session Organizers:
Ahmed Ragab, John Hopkins University
Jaipreet Virdi, University of Delaware

Participants:
Elaine Leong, University College London
Myrna Perez Sheldon, Ohio University

071. Mediterranean Entanglements: Rethinking Early Modern Medicine and Natural Inquiry

Roundtable
12:00 to 1:30 pm, Friday 8 Nov.
Holiday Inn: Lobby Level - Santiago

The goal of this roundtable is to host a discussion on how to revisit the worlds of early modern medicine and natural inquiry in light of the processes of knowledge making and transfer that took place across the Mediterranean shores. Over the last decades, scholars have offered exciting insights into the trans-imperial commercial, diplomatic, and information networks that marked the early modern Mediterranean world. However, the role of medicine and natural inquiry in shaping, maintaining, and disrupting such networks remains under-studied. Trapped between narratives of stagnation and decline and Eurocentric accounts of the ‘scientific revolution’, histories of early modern medicine and natural inquiry pertaining to the Mediterranean areas have re-enacted implicit divides, leaving the area historiographically fragmented and methodologically neglected. Bringing together scholars who have used a variety of sources and methods to approach early modern medical and natural pursuits across the Middle Sea, this roundtable discussion aims at challenging such narratives and re-envision the Mediterranean not only as a geographical entity but also as a historiographical and epistemological category. We are especially interested to highlight the fusing and polycentric aspects of the Mediterranean that facilitate a nuanced exploration of micro-historical perspectives within a cross-regional framework and to problematize the temporal categories evoked in this process. The roundtable will encourage speakers and audiences to reconsider and reconfigure the early modern Mediterranean world as a site of medical and scientific connectivity characterized by the extensive movement of both humans and non-humans within and across its shores.

Session Organizers:
Amila Buturovic, York University
Lucia Dacome, University of Toronto

Chair:
Kapil Raj, École des Hautes Études en Sciences Sociales

Participants:
Miri Shefer-Mossensohn, Tel Aviv University
Harun Küçük, University of Pennsylvania
Duygu Yildirim, University of Tennessee
Amila Buturovic, York University
Lucia Dacome, University of Toronto

072. Sarton's New Humanism in the Age of AI

"Futures" Roundtables
12:00 to 1:30 pm, Friday 8 Nov.
Fiesta Americana: Lobby Level - Yucatan I

As George Sarton explained in his vision for a “new humanism” in 1922, technological advances should be understood as among the greatest creative accomplishments of humanity, alongside those in art and music. For this reason, he argued, because it is the obligation of the humanities to understand the human condition in all its aspects, technology should rightly fall within the purview of such studies. Why, then, have the humanities ceded so much ground in debates about machine learning and artificial intelligence? This roundtable examines the obligations of historians of science in a world in which the data sciences are ascendant. Our panelists will discuss

ways that the history of science can provide the conceptual footing for reclaiming some ground and participating in debates about explainability, fairness, prediction, certainty, and neutrality — topics that are now a major preoccupation of those who seek to understand the implications of the kinds of statistical reckoning that underpins the current configuration of machine learning and artificial intelligence. The panel brings together diverse and interdisciplinary approaches on these questions, from the medieval period to the present, from the Northern Hemisphere to the Global South, and includes early career perspectives.

Session Organizers:
Iris Clever, University of Chicago
Bonnie Mak, University of Illinois Urbana-Champaign

Chair:
Soraya de Chadarevian, University of California, Los Angeles

Participants:
Allen H. Renear, University of Illinois Urbana-Champaign
Patrícia Martins Marcos, University of California, Los Angeles
Theodora Dryer, New York University
Iris Clever, University of Chicago
Bonnie Mak, University of Illinois Urbana-Champaign

073. Nahua Ways of Knowing: New Insights from Mesoamerican Science and Epistemology

Roundtable
12:00 to 1:30 pm, Friday 8 Nov.
Fiesta Americana: Lobby Level - Yucatan II

How does one divide up the senses? What constitutes a human, animal, or god? How does one best plant a field, or cure an illness? What is the underlying force behind existence? As for what it means to know (mati), the Nahuatl-speaking authors of the Florentine Codex explored knowledge and learning in many facets, from recognition through acquaintance or skill (ixihmati) to the prudence of true wisdom (nezcalihcayotl). Nahuatl-speaking communities developed novel answers to scientific, epistemological, and technological questions, tested knowledge through experimental practice, recorded and theorized their insights, and influenced other indigenous Mesoamerican groups and European interlocutors alike. This roundtable builds on a surge of scholarship to understand Nahua ways of knowing sweeping art history, ethnobotany, and religious studies, as well as the history of science. Participants will facilitate a dialogue around their novel research into the expansive and dense corpus of surviving sources, ontologically revealing language study, and community collaboration.

Session Organizer:
Mackenzie Anne Cooley, Hamilton College

Participants:
Marcy Norton, University of Pennsylvania
Alanna Radlo Dzur, Princeton University/University of Rochester
Kelly McDonough, The University of Texas at Austin
Sandra Guevara
Molly Bassett, Georgia State University
Paula De Vos, San Diego State University

074. Interdisciplinary Approaches to 20th & 21st Century Histories of Human Difference: Race/Ethnicity, Gender, Disability

"Futures" Roundtables
Futures Roundtable
12:00 to 1:30 pm, Friday 8 Nov.
Fiesta Americana: Lobby Level - Yucatan III

The history of race science is quite expansive and includes but is not limited to histories and legacies of eugenics, genetics, categorization, and determinism. This roundtable seeks to bring forth discussions on the utilization of different methods, perspectives, and critical fields in the future of historical scholarship on race science. Featuring graduate students, mid-career, and advanced scholars, the roundtable explores how the history of science can meaningfully engage with critical topics and fields such as ethnic studies, gender and queer studies, disability studies, and the digital humanities. What perspectives and strengths does this multidisciplinary approach to the history of race science produce? How can we implement interdisciplinary lenses in our analysis and use of archives pertinent to race science? How can scholars bridge the gap between the history of science and critical studies? What can we learn from this multidisciplinary approach to dispel contemporary and future permutations of race science? This roundtable encourages scholars at all career levels to participate in lively discussions about the future of the history of race science across place and time.

Session Organizer:
Grace Maria Eberhardt, University of Illinois Urbana-Champaign

Chair:
Natalie Lira, University of Illinois at Urbana-Champaign

Participants:
Sebastián Gil-Riaño, University of Pennsylvania
David Sepkoski, University of Illinois
Gianna May May Sanchez, University of Michigan
Isidro Nathaniel González, University of California, Santa Bárbara

075. Revisiting Chinese Medicine

Contributed Paper Session

12:00 to 1:30 pm, Friday 8 Nov.

Fiesta Americana: Lobby Level - Yucatan IV

Participants:

The Modern Diagnostic form of Traditional Medicine: Chinese Medical Diagnostic Texts in the Early 20th Century *Haoyu Meng, Tsinghua University*

With the introduction and establishment of modern knowledge, medicine in China underwent significant changes in the early 20th century. The introduction of modern medicine presented a formidable challenge that traditional Chinese medicine had to confront. The Chinese medicine of the 20th century was far from a remnant of pre-modern Chinese history; rather, it evolved in conjunction with Western medicine and the nationalist government, undergoing profound transformations in its institutional framework, epistemology, and material conditions, thereby creating modern Chinese medicine. Existing scholars have focused on the production of modern Chinese medicine and its integration with Chinese modernity, highlighting the manufacturing process of modern Chinese medicine and pointing out the fusion that occurred during this process. However, significant knowledge reforms also took place in the diagnosis aspect of Chinese medicine. In particular, the introduction of diagnostic and appraisal texts in modern China had a unique format. The unique diagnostic and evaluation forms used in the early Republic of China period included various elements such as medical records and certificates which influenced specific medical practices. Chinese medicine adopted this new diagnostic and appraisal format that was evolved from Japan and different from Western practices. It was through the utilization of this new knowledge form that Chinese medicine was able to integrate into the official medical appraisal system recognized by the judicial system.

Acupuncture Across Borders: Sino-Soviet Scientific Exchanges and the Pavlovianization of Traditional Chinese Medicine *Simon Huxtable, Birkbeck, University of London*

After Chinese communists took power in 1949, Soviet experts enjoyed a close relationship with their Chinese counterparts in which scientific and technical cooperation played an important role. In the 1950s, Soviet doctors and scientists visited China in increasing numbers and many of them became interested in Traditional Chinese medicine. In this paper, I ask how Soviet scientists understood the workings of acupuncture and how they tried to integrate it into the Soviet healthcare system. The paper will first of all examine Soviet scientists' engagement with acupuncture in the 1950s. It will show how Soviet scientists attempted to square traditional Chinese ideas about acupoints and meridians with Pavlovian theories. To do so, they developed a new theory of 'biologically active points', which connected the skin's surface with the activity of internal organs. The paper goes on to explore how the Soviet Union tried to integrate acupuncture into its healthcare system before and after the Sino-Soviet split. Acupuncture was seen as a cost-effective, easy-to-implement treatment with high success rates for a range of conditions. The paper asks how and why a treatment so closely identified with a now-hostile country could be so effectively introduced into the Soviet Union. The paper is in dialogue with existing scholarship on the 'Pavlovianisation' of TCM (Taylor 2011; Fan 2013; Xi 2015; Zhang 2021) and Soviet approaches to TCM (Nagornykh 2017, 2021; Nagornykh & Shok 2020, Onetov 2022), while advancing that research by drawing on untapped primary sources.

'Contributing to the World': The Integration of 'Western Medicine' and 'Traditional Chinese Medicine', the Creation of Acupuncture Anesthesia and the Socialist Internationalism *Liang Wan*

Scholarly literature has extensively explored the modern invention of traditions within the framework of 'Traditional Chinese Medicine (TCM)' during the People's Republic of China (PRC) era. The development and international promotion of acupuncture anesthesia, a hallmark of this period, epitomizes the concerted efforts of the Chinese Communist government in the latter half of the 20th century. Originating in 1958 during the apex of the Great Leap Forward (1958 – 1961), acupuncture anesthesia quickly gained prominence for its purported ability to anesthetize patients during surgeries solely through the use of needles. Its touted benefits included patient consciousness during procedures, minimized side effects, and reduced costs. Aligned with the government's vision to 'create a new form of medicine' by integrating Western Medicine and traditional

Chinese Medicine, acupuncture anesthesia was championed as a revolutionary alternative to capitalist anesthesia methods. Moreover, it was portrayed as a triumph of socialist internationalism, resonating with Asian, African, and Latin American countries in their struggle against imperialism. This paper delves into the historical trajectory of acupuncture anesthesia from its inception in the late 1950s to its dissemination in the early 1970s, arguing that TCM, from its outset, reflected a distinct socialist internationalist ideology.

Emotive Forces in Public Health: Nationalism, Socialism, and the Smallpox Vaccination Campaign in 1950s China *Lu Chen*

This paper explores the critical role of nationalism and socialism-driven emotions in China's successful smallpox vaccination campaign during the volatile 1950s. Drawing upon Benedict Anderson's concept of nationalism as an "imagined community" and Barbara Rosenwein's notion of "emotional communities," this analysis examines how emotional bonds and collective identities shaped public participation in health movements. It specifically focuses on the extensive smallpox immunization efforts in the early 1950s, during a time overshadowed by the Korean War and subsequent allegations of germ warfare by the United States., which spurred the Chinese government to initiate patriotic health campaigns, leveraging anti-imperialist and nationalist sentiments to mobilise mass participation in public health movements. The emotional rhetoric of these initiatives, which called for peace, justice, and resistance against imperialism, was important in uniting communities and promoting active participation in health-related programmes. The paper further investigates how these shared emotions also contributed to the formation of cooperative international health frameworks amongst socialist and developing nations, presenting a counterpoint to Western-dominated medical paradigms. The study underscores the indispensable role of collective emotions in the conception and implementation of health strategies, demonstrating their potency in enhancing public health on a domestic and international scale.

076. Transforming Land, Body, and Mind: Science and Technology as Politics in Palestine/Israel

Organized Session

3:30 to 5:00 pm, Friday 8 Nov.

Fiesta Americana: 1st Floor - Izamal I

Zionism relied extensively on science and technology in achieving its political objectives, particularly the colonization of Palestine. This entailed the transformation of the physical land, as well as the body and mind of the ‘new Jew’ settling in Palestine. The connection between science and colonization was not unique to Palestine. Rather, Zionist scientists, thinkers, and engineers were trained in European institutions and operated as part of a transnational network of knowledge production, borrowed from and inspired by theories and practices used in the colonies. STS scholars focusing on Palestine/Israel demonstrated that despite claiming to improve Palestinian lives, Zionist use of science and technology relied on and promoted exclusionary practices: through mechanization, Zionists were able to claim a larger portion of the labor market at the expense of Palestinian manual labor; through Western scientific discourse, they marginalized local forms of expertise. Moreover, the positioning of Zionism as scientific–and therefore modern–made it difficult for Palestinians to object to Zionist projects that directly and indirectly facilitated their displacement. This panel builds on questions arising from the scholarly conversation about the relationships between science, technology, and politics in the history of Palestine/Israel. It brings together scholars working on the history of psychiatry, agriculture, nuclear energy, and the discourses of (colonial) expertise, to analyze the political logics and mechanisms of these scientific interventions. By comparing the implementation of these disciplines in Palestine/Israel from early Zionism until after the 1967 war, the panel asks: how were different sciences and technologies theorized and implemented in Palestine/Israel? What can we learn from the overlap of separate scientific and technological fields in Palestine/Israel about the impact of interdisciplinary exchange? How has the political context of Palestine/Israel shaped knowledge production and scientific practices?

Participants:

Early German Zionism as Scientific Colonialism *Olivier Baisez, Université Paris 8 Vincennes Saint-Denis*

In the early years of the Zionist movement, up until the end of World War I, German Jews like Franz Oppenheimer, Arthur Ruppin, Selig Eugen Soskin, Felix Theilhaber, or Otto Warburg held prominent positions within the organization’s major organs and exerted significant influence in taking Zionism from small beginnings to large-scale settlement schemes. Those men were driving forces in advisory bodies like the Palestine Commission

or the Committee for the Economic Exploration of Palestine. In numerous publications, they elaborated a methodological discourse on the best ways to achieve their stated goal of a Palestine populated by Jews, as well as discourse on the role to be played by scientific experts in the process. Living in the age of high imperialism, and as citizens of an ambitious colonial power, they conceived of themselves not only as experts pursuing a technocratic endeavor (Penslar 1991, Suffrin 2019) but also as members of a transnational colonial community, fully integrated into the dynamics of European expansion and consciously seeking to emulate instances of successful colonization, past and present, as well as building on the achievements of 19th-century surveys of Palestine (Goren 2003). This paper proposes to see them as key actors in the scientization of colonialism as a cultural code (Kwaschik 2020), as participants in the acquisition, production, diffusion, and application of colonial knowledge. Thus, Palestine was both a place of yearning and a testing ground for theories and ideas developed in German research institutions, in fields ranging from botany and geology to the social sciences and urban planning. The German Zionist experts of this period produced a mixed discourse, pushing for the practical application of scientific knowledge for the sake of both Zionism in particular and colonization in general.

Changing One's Mind: The Question of Racial Mutability in Zionist Psychiatry during the Late 19th and Early 20th Century ***Elias Moufid Taweel, Columbia University***

From the late 17th to mid-20th century, the question of Jewish emancipation and political and civil rights in Europe often pivoted upon whether the Jews were to be considered a race or a faith community. The then-prevailing European scientific and nationalistic discourse deemed the Jews as suffering from degenerative qualities reflected in biologically and psychologically pathological characteristics rendering them unfit for social and political integration. To become "a nation like other nations", as Herzl wrote, the Zionist movement had to establish the prospect for Jewish regeneration, health, and political capacity for self-determination. As Hart and Efron's extensive scholarship on the subject has shown, Jewish and Zionist philosophers, philologists, social scientists, and psychiatrists argued for an etiological explanation grounded in environmental and historical factors as opposed to biology and racial determinism. While they often agreed with the premise of Jewish degeneracy and pathology, they took up the task of challenging and undermining the arguably cardinal antisemitic and Lamarckian-inspired claim of the heritability and racial immutability of psychological traits. Tasked with the constitution, regulation, and perpetuation of the "New Jew", psychiatry was central to the Zionist social engineering project. Accordingly, this paper makes three principal arguments. Firstly, Zionist psychiatry reformulated the question of racial im/mutability to one of in/curability, and in the process, reconfigured orientalist and anti-semitic tropes into ethnographic codifications of psychiatric disorders. Secondly, while Zionist psychiatry assumed the curability of Ashkenazi Jews, it took a more ambivalent and disciplinary approach toward Mizrahi Jews. Lastly, when it came to the native Arab population, it would seem that Foucault's argument of psychiatry "no longer" seeking to cure, but "merely offering to protect society" would apply. The psychology and management of the native came to be largely reserved for the domains of security expertise and intelligence. By proposing an alternate, philological genealogy of colonial and Zionist psychiatry centering on the construct of racial mutability, this paper explores the conditions by which psychological discourse and political power extend into and mutually reinforce one another.

Agricultural Experiments in the Negev/Naqab Desert under the British Mandate: Revisiting the Impact of Success and Failure ***Sahar Mor Bostock, Columbia University***

This paper focuses on the relationship between agricultural experiments and political claims for land in the desert of Southern Palestine, known today as the Negev/Naqab. The Zionist movement did not make a systematic effort to settle in the desert until relatively late in Zionist history, during the 1940s. Palestinian opposition to land sales and British restrictions combined with the internal uncertainty about the ability of Jews to live a sustainable life in the desert, thereby postponing the Zionist turn to the South. It was only after Zionist activists settled in experimental posts and executed agricultural projects that they managed to convince both the Zionist institutions and the UN Special Committee on Palestine (UNSCOP) that the Jews could "make the desert bloom." In contrast with earlier plans for the partition of Palestine, the 1947 partition

plan granted the desert to the future Jewish state. The paper revisits the early dry farming experiments of the British Ministry of Agriculture and Fisheries and the reasons for their failures, arguing that the failed experiments contributed to the image of a hostile uninhabitable desert. The paper then examines the Zionist agricultural experiments and demonstrates that they relied heavily on relationships with the local Bedouins. Zionist advocates claimed that Bedouins were not able to exploit the entire potential of the desert land because of their traditional farming methods. At the same time, the settlers examined Bedouin agricultural practices and imitated them in their experiments. I argue that Zionists claimed the right to develop the desert through a discourse of scientificity: they fashioned their practices as scientific, technological, and therefore modern, in opposition to Bedouin backwardness. The hierarchy they constructed between traditional and modern agriculture played a role in justifying partition, and consequently, the displacement of 90% of the desert's population during the 1948 war.

Atoms for Peace in the Middle East: Technology, Labor, and Peace in US Policy *Heba Taha*

In the aftermath of the Six-Day War in 1967, a US-led plan to build nuclear reactors in the Middle East started gaining traction. Now known as the Strauss-Eisenhower Plan, it followed the same logic as Atoms for Peace: to share peaceful nuclear technology as part of diplomacy. US officials proposed building three nuclear power plants in the Middle East: two on the border between Israel and Egypt, and one on the border between Israel and Jordan. The powerplants were expected to desalinate water and generate electricity, and by operating these nuclear reactors collectively, these Arab states and Israel were expected to make peace. The plan also envisioned the return of Palestinian refugees who had been displaced from their lands in the Nakba in 1948. The architects of the plan embraced Zionist tropes of a 'barren' land, and suggested that by transforming the land through nuclear technology, it would then be made suitable to settle Palestinian refugees – a link that ultimately reduced Palestinian dispossession to the apolitical issue of availability of fertile land, rather than Israeli policy. Yet, the various iterations of the plan all treated Palestinian labor as a key component for the success of the project, with a specific emphasis on using their 'unskilled' labor to build the powerplants, pipelines, powerlines, reservoirs, and other technology. The research analyzes how technology, labor, and race were conceptualized in the context of the Strauss-Eisenhower Plan and how this unrealized project reflected ideas of a US-led capitalist utopia.

Session Organizer:

Sahar Mor Bostock, Columbia University

Chair:

Heba Taha

077. Decomposing and Decaying Knowledge

Organized Session

3:30 to 5:00 pm, Friday 8 Nov.

Fiesta Americana: 1st Floor - Izamal II

Decaying papers, molding petri dishes, rotting specimens: all too frequently decomposition is thought of as an obstacle to knowing or as a nuisance that impedes scientific inquiry. Mirroring a long history of Western aversions to rotting and fermenting things, decay generally needs to be cleared away for research to function properly. This panel, by contrast, attends to the complexity of decay and decomposition by looking at them as multifaceted processes with generative potentials for understanding. Problematizing a strictly negative view of decay, the papers cover a variety of fields, from the life sciences to industrial research, and multiple time periods, but with a focus on the twentieth century life sciences and ecology. As decay and decomposition increasingly come to be viewed in a positive light and generate insights for creating a habitable future, this panel invites an exploration of alternative historical narratives that we might uncover by centering these processes.

Participants:

Life in Decay: Saprophyte Science and the Nature of Industry *Charles Kollmer, California Institute of Technology*

Beginning in the late nineteenth century, researchers interested in the lives of microbes routinely distinguished between two kinds of organisms: pathogens and saprophytes. Where pathogens inhabited the bodies of specific host organisms, saprophytes lived untethered to hosts and thus made themselves at home virtually everywhere. These ubiquitous microbes made their presences known to humans largely by decomposing animal and plant matter, processes accompanied by conspicuous sights and smells. As saprophytes flourished on diets of organic matter, they clouded fluids, coated surfaces in slime, and emitted stenches. These processes, especially their manifestations in industrial and agricultural settings, became focal points of scientific inquiries across the globe. This essay

sketches strands of research in Europe, North America, and Southeast Asia, in which the decay wrought by microorganisms proved epistemically fecund for attentive researchers. In its promiscuous and sometimes radical divergences from the patterns of respiration in animals and photosynthesis in green plants, microbial decomposition provided a window into metabolic alterity, impressing researchers with unusual feats of chemical dexterity. Paradoxically, the microbial strains that researchers often subjected to study flourished on diets of the products and byproducts of humans' own biotechnical endeavors. Thus, as they sought signs of life in decay, saprophyte scientists also produced records of the technological transformations of anthropogenic, industrial natures.

Empire's Deadwood: Decomposing Vegetation in the American Imperium ***Boyd Ruamcharoen, Massachusetts Institute of Technology***

During the Pacific War, the U.S. military grappled with the challenge of "tropical deterioration," where materials rapidly fell prey to fungi thriving in intense heat and humidity. Of major concern was the decomposition of cellulose, the most abundant organic compound with diverse industrial applications ranging from fabric to electrical insulation. While this fungal threat caught the U.S. military off-guard, it was hardly news to scientists whom the military consulted. This paper sketches a longer history of the study of decomposing vegetative matter in the United States and its tropical territories from the early twentieth century to the postwar era. Efforts to combat the decay of plant products, like timber, were motivated by the imperial agenda of conserving natural resources: prolonging their lifespans would reduce wasteful resource consumption. Research into the breakdown of dead vegetation, crucial to its prevention, was closely related to phytopathological investigations into diseases in living plants; both shared a focus on bacteria and fungi as key contributors to these phenomena. Studies of decomposition, however, placed greater emphasis on studying these microbes in their natural habitats (in vivo) rather than as isolated pure cultures (in vitro)—an approach that facilitated a deeper appreciation of the natural cycle of elements between the living and the non-living. The science of decomposition and its prevention thus surfaces not only an underappreciated strand in the history of microbiology, but also an alternative genealogy from conservationism to ecological environmentalism—one that was haunted by U.S. imperial anxiety around natural resource scarcity.

Packing Problems: Decay, Industrial Mycology, and International Shipping ***Brad Bolman, University of Chicago***

Around the same time that their American counterparts were beginning to grapple with the challenge of deteriorating materials in tropical environments, British military officers worried that the infrastructure of their combat efforts was falling apart on the Pacific front. Gun sights became too cloudy to see through, tents were eaten by fungal growths, and boots fell off the feet of the soldiers who wore them. Unlike Americans, who had become the world's experts in plant pathology, British scientists struggled initially to respond. This paper shows how the UK approach to "tropic proofing" drew on limited, prior experience with safely packing commodities for shipment to British colonies and studies of fungal disease. What emerged from this interdisciplinary work was the field of "industrial mycology," the large-scale production of fungal products and prevention of mold, along with its earliest textbooks and case studies. The paper shows how industrial mycology established foundations for modern, global commerce by establishing practices and technologies of desiccation aimed at managing mold during the international movement of commodities. Connecting the history of the life sciences to the emergence of rapid international commercial exchange, the paper shows unexpected influences of mycological knowledge on the development of global capitalism.

Animated Archive: A Critical Media Approach to the History of Science ***Beatrice Steinert, Harvard University***

Our archives of science are in a state of continuous decay, rendering the histories they tell incomplete. Not only are the records of the past perpetually breaking apart into their elementary states–the inevitable loosening of chemical bonds–they also reflect the decay of history itself: many scientists, ways of knowing, and elements of practice have been left out. Drawing on Saidiya Hartman's notion of "critical fabulation" and feminist theory, "Animated Archive" proposes an arts-based critical media approach to archival research and the stories we construct from it. Through two case studies

from mid-twentieth century developmental biology, I show how decay presents an opportunity to embrace new methods in the history of science. Working primarily in the 1930s and 40s, John Tyler Bonner visualized slime mold development across a variety of media–time-lapse imaging, physical modeling, and drawing–to investigate how cells collectively sculpt the dynamic morphologies of multicellular bodies. I am intervening in Bonner's archive to introduce elements of his practice that have been lost: images, 3D models, tissue sections, and the embodied animation that stitched these materials together. The second project seeks to create a moving-image archive for Ethel Browne Harvey–a pioneering developmental biologist who studied the fundamental plasticity of animal cells and tissues–through the genre of the essay film. I argue that moving-image media can show the sensorial density of embodied knowledge, do justice to the complexity of science in context, and create a presence for marginalized historical voices.

Session Organizer:
Boyd Ruamcharoen, Massachusetts Institute of Technology

Chair:
Brad Bolman, University of Chicago

078. Women's Work

Contributed Paper Session
3:30 to 5:00 pm, Friday 8 Nov.
Holiday Inn: Lobby Level - Maya

Participants:

The Humboldtian New Synthesis: The Women who Brought Humboldt's Aesthetics and Science to Life. ***Alan Rauch, University of North Carolina-Charlotte***

Even though it is rarely acknowledged--virtually every English version of Alexander Humboldt's works in the 19th century, was translated by a woman. Humboldt's perspective on nature, drawn from the still unfamiliar terrain of South America offered a view of life that was interconnected. In this paper, I argue that the Humboldtian perspective, which resisted taxonomic inventories (pace Linnaeus, Buffon, Cuvier), for a syncretic view of the world. His work held a special appeal to women who were themselves imagining a syncretic approach to organic life. These women, including Thomasina Ross (1794-1875), Elizabeth Juliana Sabine (1807–1879), and Elise Otté (1818-1903). The translation by Otté remains the dominant English version to this this day, and the same can be said of her 1850 edition Humboldt's Views of Nature. Edmund Gosse characterized Otté as "one of the most learned women of her time, especially in the departments of philology and physical science." Humboldt's appeal, particularly to a reading audience that included women, is articulated by Helen Maria Williams (1759-1827) in the Preface to her translation of Humboldt's Personal Narrative. "Happy the traveller," she writes, "with whom the study of Nature has not been merely the cold research of the understanding, in the explanation of her properties, or the solution of her problems!" Williams acknowledges, with some exaggerated humility, the responsibilities of a translator of a major scientific work. Translating Humboldt for these women spoke directly to an understanding of a novel scientific approach to nature that comprehended organic and aesthetic principles.

Women, Gender, and the Academic Workforce among German-Speaking Emigré Neuroscientists in North America, 1933-1963 ***Frank W. Stahnisch, University of Calgary***

This paper looks at the social history of émigré Jewish and non-Jewish female neuropsychiatrists by following their emigration avenues as these women were affected by prevailing cultural gender norms, on their work, their status as refugees, and their future lives in their new host countries. The biographies and fates of these individuals display a variety of careers between success and despair. Their behaviours as remarkable female academics, seeking a safe haven overseas for themselves, their families, and loved ones, are illuminated between the boundaries of several cultures. They sought to retain cultural ways or embrace new ones, raising teenagers in the midst of this turmoil, losing touch with family left in Germany or France or eastern Europe, dealing with the insecurities of some North American colleagues towards themselves or toward their partners. This situation enabled them to cultivate solidarity among themselves or distant regional networks to overcome the challenges that refugees experienced. From diverse individual experiences, we can gather that the category of gender played a considerable role in the adjustment process of émigré neuropsychiatrists, their personal situations greatly varied. Significant factors included their age, whether they had children, whether they could take personal belongings with them, the year of their emigration, whether they were

accompanied during their migration process, their religious backgrounds, political opinions, as well as their experiences in laboratories, clinics, or social medical departments. In terms of the immigration regulations, married women and children who accompanied refugee academic husbands had been privileged in Canada and the US.

Stewarding the Sea: Sea Women and the Preservation of Ecological Knowledge *Alice Hong, Princeton University*

The ama in Japan and haenyeo in Korea have recently been spotlighted as examples of communities who are perceived to embody the "intangible cultural heritage" of humanity. Ama and haenyeo—both terms literally meaning "sea women"—are female divers renown for not using breathing equipment as they dive to gather shellfish and seaweed from the ocean floor. However, due to changes wrought by social, political, economic, and ecological developments over the course of the twentieth century, the ama and haenyeo are aging communities. The number of these divers, especially young divers, is dwindling. For both the ama and haenyeo, notions of environmental stewardship and the role of women's work in the community are brought to the fore as reasons for their cultural and historical value, and recent media portrayals in documentaries, films, and novels emphasize their resilience and their endangered status. This paper seeks to historicize the emphases on traditional knowledge, environmental stewardship, and notions of care underlying these women's relationship with the sea. In particular, I compare recent portrayals with 1960s and 1970s physiological studies on the sea women, which exoticized the women and portrayed their way of life as being outside the bounds of modernity. While the women's current "intangible cultural heritage" status has brought benefits for their respective communities in the form of increased environmental protections and funding for museums and diving schools, it has also resulted in a new tourist industry that made the women into living artifacts who perform their work for tourist audiences. The renewed cultural interest in sea women echoes older historical tropes of extinction, salvage, preservation, commodification, and nationalism.

079. Race, Mobility, and the Relational Contexts of Asia/America in Histories of Science and Technology

Organized Session
3:30 to 5:00 pm, Friday 8 Nov.
Fiesta Americana: Lobby Level - Salon Celestun

Whether as a geographical space or as an analytic for understanding knowledge production, conceptions of "Asia" have long been conceived in relation to science and technology. For instance, they have shaped how scientists approach their networks and subject matter, as well as how governments structure migration policies and knowledge regulation. Historical research can excavate the technical practices, institutional structures, political tensions, and cultural meanings undergirding these dynamics. More recently, critiques of historical and contemporary figurations of "Asia" have highlighted the asymmetrical power relationships between the "West and the rest" or "Global North and Global South." This panel aims to contribute to these discussions by situating histories of science and technology within the cultural, political, and spatial contexts of "Asia / America." Using examples from the long twentieth century, the papers discuss different knowledge regimes and periods to highlight how the relational racial notion of Asian / American contoured the migration and mobility of peoples and the circulation of knowledge. Collectively, the panel foregrounds new ways of integrating critical perspectives from Asian and Asian American studies into the history of science and technology.

Participants:

"Racial Differences in Intelligence": Japanese Americans & Intelligence Testing in the Early 20th Century *Jeannie Shinozuka, Washington State University*

Hisakichi Misaki, a student of psychologist and eugenicist Lewis Terman at Stanford University, wrote in his 1927 thesis that "between various racial groups in the United States distinct mental differences exist" ("The Effect of Language Handicap on Intelligence Tests of Japanese Children," 1). The development of Terman's 1916 Stanford-Binet intelligence test came at a time when people of color were increasingly viewed as problems that must be addressed—including the question of education and its ties to psychology, criminality, and immigration. Much of the literature on racial intelligence testing has come from psychology, education, and anthropology with little to no analysis about the history of relational racial formations of Asian Americans and African Americans. This talk is on Hisakichi Misaki, a Japanese American who participated in Terman's study in the early twentieth century and helped develop eugenic technology about

students of color using intelligence testing for socioeconomic mobility. The paper is on the relational racial construction of Asian American and African American students at the height of eugenics and intelligence testing in the early twentieth century in order to better understand the interrelationship between education, scientific racism, and citizenship. Some Asian Americans used racial intelligence testing as way to position themselves as superior to their Black counterparts. In other words, some Asian Americans used racial science not to challenge white supremacy in the early twentieth century but to reify racial hierarchies in an attempt to raise their status within American society. These Asian Americans researchers used the results of eugenic tests to construct model minority intelligence—an intelligence that could only exist with the essentialism of Black American unintelligence. No matter how progressive these researchers may have thought of themselves, in the end they played key roles in shaping exclusionary policies in education, immigration legislation, and citizenship.

The Datified "Enemy Alien": Computational Work and Japanese American Incarceration during World War II ***Clare Kim, University of Illinois at Chicago***

Following the events of Pearl Harbor in December 1941, a series of U.S. presidential proclamations and executive orders authorized the legal designation and treatment of people of Japanese ancestry as "enemy aliens." The designation of the US West Coast as military zones under Executive Order 9066 enabled the removal and subsequent incarceration of more than 120,000 Japanese Americans in internment camps. The problem of identifying, incarcerating, and managing Japanese enemy alien populations necessitated the treatment of these military zones and spaces as information environments, where the classification of Japanese and Japanese American residents as enemy alien, citizen, or an alternative subject position could be adjudicated. This paper explores how conflict in the Pacific theater of World War II contoured the entanglements between computational work and Asian and Asian Americans residing in the U.S., recounting the setup of statistical laboratories established to track and manage Japanese American incarceration. It reveals how datafication practices were collapsed and equated with bodies that were racialized as an enemy alien and yellow peril, which paradoxically effaced other subject positions to which Japanese Americans came to occupy at the time: in particular, the invisible labor to which they furnished to statistical work as technical experts themselves.

Revisiting Semiconductors through Migration and Labor History ***Heather Ruth Lee, New York University Shanghai***

In a recent speech at MIT, Morris Chang credited the talent pool of Taiwan for the success of his company, Taiwan Semiconductor Manufacturing (TSCM), which makes 90% of the most sophisticated semiconductors produced today. Many have tried to puzzle the secret to TCSM's unparalleled dominance of a critical market to the world economy that has also become a source of geopolitical tension. Instead of merely thinking about his success in technological terms, Chang underscored the typically overlooked factor of well-trained and dedicated engineers, technicians, and operators. "All of them are important, not just engineers," he added. This paper takes Chang's framing of technological innovation as a labor concern as the launching point. Developed during the Cold War, the semiconductor enabled the United States to break ceilings in computing capacity, vital to many dimensions of U.S. military defense strategy. Some of the key pioneers, like Chang, were born outside of the United States and had emigrated to study, and when conditions in their homes deteriorated, to work as well. This paper focuses on the legal funnel through U.S. immigration policy, such as educational visas, that enabled engineers and other critical intellectual scientific talent to emigrate. While talent came from around the world, this paper focuses on individuals who originated from Mainland China, Taiwan, and Hong Kong, because this cluster of individuals would concentrate production power in Asia in the late Cold War. It also emphasizes the migration histories of lesser-known figures, like Zhang Rujing, the talented engineer who, like Chang, also worked at Texas Instruments.

Session Organizer:
Clare Kim, University of Illinois at Chicago
Chair:
John Cheng, Binghamton University
Commentator:
John Cheng, Binghamton University

080. (Post-)Imperial Go-Betweens: Transdisciplinary Rereadings of Cross-Cultural Encounters

Organized Session
3:30 to 5:00 pm, Friday 8 Nov.
Fiesta Americana: Lobby Level - Salon Mérida

The year 2024 will mark fifteen years since the publication of the influential edited volume The Brokered World (2009) and the twentieth anniversary of James Secord's signal plenary address, "Knowledge in Transit" (2004). In the intervening years, circulation, go-betweens, mediators, and global exchange have become widely researched topics in the history of science, technology, and medicine. The study of early modern and modern empires of knowledge has been particularly enriched by this methodology. At the same time, critics of the circulation model have posited that knowledge need not travel far for it to be worthy topic of study. Moreover, a focus on go-betweens has the potential to erase the contributions of local actors and knowledge producers whose orientation was not quite so cosmopolitan. Drawing on methods from feminist theory, material culture studies, literary criticism, religious studies, and subaltern studies, the papers collected here take on the question of go-betweens, movement, and modernity from new vantage points. The scholars represented on this panel utilize the cases of leading, culture-crossing figures to elucidate local and intimate conditions of knowledge production in equal measure with supralocal forms of exchange. Lan Li draws on the personal belongings of Lu Gwei-djen—a crucial contributor to the history of science as a field—for object lessons as she navigated racial and gender politics while working in China, Europe, and the United States ca. mid-twentieth century. Minjung Noh reassesses the life and work of the Methodist doctor Jean-Baptiste Dehoux through both local institution-building in Haiti and engagement with metropolitan France in the "bizarre" post-independence period. Anurag Advani uses intertextual methods, reading Urdu poetry alongside medical treatises, to reveal how the seminal poet Mir Taqi Mir developed representations of madness across Perso-Indic knowledge traditions in the late Mughal Empire. Nikhil Joseph Dharan takes G. Srinivasamurti's experiments with medical pluralism in late colonial Madras to illustrate how colonialism shaped the institutionalization of traditional Indian medicine, an exercise in reading against the grain. Taken together, these papers demonstrate a renewed approach to circulation—one which views complex local circumstances as fundamental for understanding knowledge across boundaries, told through the lives of exceptional go-betweens.

Participants:

"That One System of the Future": The Limits and Possibilities of Plural Medicine in Late Colonial Madras ***Nikhil Joseph Dharan, University of Pennsylvania***

In the late 1920s, Captain G. Srinivasamurti appointed the first two resident medical officers for the Hospital of the School of Indian Medicine in Madras. As principal of the institution, Srinivasamurti had a vision for revitalizing the teaching and practice of Siddha, Ayurveda, and Unani medicine through engagement and integration with colonial, allopathic medicine. Thus, he sought to retain one resident trained in Western medicine and one in Indian medicine, but nevertheless expressed hope that such an "allocation may not be necessary after some time when there will be no need to talk in terms Western and Indian systems separately, every member of the staff being then conversant with that one system of the future of which all the existing systems would be but parts." My paper will interrogate this future-oriented program of medical pluralism by unraveling how Srinivasamurti's rhetoric and vision were translated into pedagogy and clinical practice during his nearly two-decade tenure. As a part of the revival of Indian medicine in the early twentieth century, the School of Indian Medicine utilized state resources towards the credentialing of Indian medical practitioners for the first time in the Madras Presidency, the largest colonial polity in South India. I will discuss how the students and staff of the school participated in experimental forms of plural medicine, through the incorporation of gross anatomy, surgery, botany, clinical research, and other topics into programs of traditional Indian medicine. By reading against the grain, I will also detail how institutionalization was inherently Westernization, disrupting existing pedagogies and making Indian medicine more easily governable for the colonial state. Although Srinivasamurti's experiment did not last long into the postcolonial period, I will ultimately demonstrate how the colonial context engendered both limits and possibilities for plural healthcare.

Madness as Mental Illness: Indo-Persian Medicine and Urdu Poetry in Late Mughal India ***Anurag Advani, University of California, Berkeley***

In mid-eighteenth century Delhi, the famous Urdu poet, Mir Taqi Mir, wrote a narrative poem titled Maṣnavī-yi Khvāb-o-Khayāl ("The Dream and Imagination of Mir", 1752), where he

described the progression of the poetic narrator's melancholia and insanity, and his eventual confinement, treatment and recovery. In so doing, he built on extant knowledge of Greco-Arabic (Unani) and ancient Indic (Ayurvedic) medicine about the category of "madness" (dīvānagī or junūn). The causes, symptoms, sub-types and treatments for insanity were discussed in contemporary Indo-Persian manuscripts, in particular two treatises by Hakim Muhammad Akbar Arzani, Ṭibb-i Akbarī ("The Medicine of Akbar", 1700) and Mīzān al-Ṭibb ("Scales of Medicine", 1708). Arzani juxtaposed the Unani theory of four bodily humors and the excess production of black bile in the brain with an Ayurvedic understanding of imbalance among three humors in the body to discuss the onset of melancholia, mania, delirium, lovesickness, lycanthropy, and other forms of insanity. This humoral imbalance gave rise to symptoms varying from laughter, mood swings, confusion and foolishness, to anger, distress, moroseness and licentious love. The treatments prescribed for such manifestations of madness included bloodletting, sprinkling breast milk, rubbing violet and almond oil on the body, and bathing. In reading Mir's maṣnavī against Arzani's medical texts, this paper will argue for the gradual incorporation of advancing scientific acumen in poetic discourse, thus showcasing the importance of an inter-genre reading of insanity to understand changing mindscapes and psychological temperaments in early modern South Asia. Arzani built on a centuries-old engagement of philosopher-physicians (ḥakīms) in Sultanate and Mughal South Asia identifying new causes, diagnoses and treatments for various mental illnesses. At the same time, Mir's poetry was written against the backdrop of the Iranian ruler Nadir Shah's invasion of Delhi in 1739, and was influenced by classical Persian and Hindi (Brajbhasha) literary canons, revealing the shared Perso-Indic cosmos of early modern north India.

The "Bizarre Period of Independence" and Nineteenth Century Haitian Medicine ***Minjung Noh, Lehigh University***

Following the Haitian Revolution and subsequent independence, Haiti faced international isolation from slave-holding European nations and the Vatican. This religious, economic, and political isolation damaged the fledgling republic's establishment and its efforts toward modernization. Described as a "bizarre period of independence" by an anonymous author in the 1930s, the years between 1806 and 1860 witnessed the spread of Protestant Christianity to Haiti in lieu of the Catholic Church's absence. Protestant missions, including Methodists, Anglicans, and Quakers, provided educational and medical resources to the republic, laying the foundation for modern medical institutions. This paper explores the life of Methodist doctor Jean-Baptiste Dehoux, a pivotal figure in the history of modern medicine in Haiti. Dehoux revolutionized medical practice in Haiti by leading the National School of Medicine, which sent numerous students to France for advanced training. He introduced crucial medical techniques such as microscopy and dissection to Haiti and founded the Medical Society of Haiti. Additionally, he served as a medical historian, publishing his Rapport du Dr. J.-B. Dehoux au Gouvernement sur les institutions hospitalières et médicales d'Haïti, leur passé depuis 1804 on behalf of the Haitian government. This work remains largely under-researched in the history of Haitian medicine. Through a close examination of Dehoux's life and contributions, this paper initiates an exploration of Protestant modernity and colonial foundations in the field of medicine during the "bizarre period" of Haitian independence.

Pearl and Pen: Object Lessons in Transnational Feminist Histories of Science ***Lan A Li, Johns Hopkins University***

Lu Gwei-djen lifted her chin. She pinched the tip of her collar, deftly maneuvering the pin that punctured silk like butter. Handling with care, Lu secured the broach to the other side of the collar. She adjusted the narrow silver-diamond frame that accented a small row of pearls. It was barely an inch long, adding a touch of glamour to the classic silhouette of a qipao neckline. This paper is the beginning of a longer exploration of Lu Gwei-djen (1904-1991), known as the primary collaborator who spearheaded Joseph Needham's famous Science and Civilization in China series. While Lu actively concealed her accomplishments and contributions, her peers considered her one of the most accomplished self-trained historians of East Asian medicine. This paper attempts a closer look at Lu Gwei-djen's life through a material and social analysis of her belongings to understand how she navigated the racial, political, and gendered spaces in Beijing, Shanghai, Cambridge, Paris, Berkeley,

and New York, where she worked and lived as a biochemist in the 1930s and historian in the 1970s. I aim to examine Lu's life through object lessons, a feminist material cultural methodology often practiced in art history and museum studies. Taking mundane and domestic artifacts often overlooked in social and political histories of science allows me to explore an otherwise unseen world of movement, meaning, and labor among foreign and female scholars. Doing so further enables me to explore the conditions of knowledge production among Asian female scientists and scholars in the twentieth century.

Session Organizer:

Nikhil Joseph Dharan, University of Pennsylvania

Chair:

Bharat Jayram Venkat, University of California, Los Angeles

081. Intelligence, Artificial and Otherwise

Contributed Paper Session

3:30 to 5:00 pm, Friday 8 Nov.

Holiday Inn: Lobby Level - San Jacinto

Participants:

Neurons on Paper: Writing as Intelligence before Deep Learning *David Dunning, University of Pennsylvania*

In their watershed 1943 paper “A Logical Calculus of the Ideas Immanent in Nervous Activity,” Warren McCulloch and Walter Pitts proposed an artificial neural network based on an abstract model of the neuron. They represented their networks in symbolism drawn from mathematical logic. At the same time, they developed a novel diagrammatic system, now known as “McCulloch–Pitts neuron notation,” depicting neurons as arrowheads. Together these two inscriptive systems allowed McCulloch and Pitts to imagine artificial neural networks and treat them as mathematical objects. In this manner, they argued, “for any logical expression satisfying certain conditions, one can find a net behaving in the fashion it describes.” Abstract neural networks were born as paper tools, constituting a system for writing logical propositions. Attending to the paper-based materiality of early neural network techniques affords new historical perspective on the notoriously opaque technology driving contemporary AI. I draw on archival sources and close analysis of the classic paper’s inscriptive practice in order to situate McCulloch and Pitts in a material history of logic. Over the preceding century, mathematical logic had emerged as a set of practices for representing reason with marks on paper. It was a tradition shot through with anxiety around the shortcomings of human-crafted symbolic systems and typographic infrastructures. Neural networks’ origin as imperfect inscriptive tools offers a window on a moment before the closure of a potent black box, one that is now shaping our uncertain future through ever more powerful, ever more capitalized deep learning systems.

“Machines Without the Certainty of Machines:” Labor, Trust, and Agency in the Great Trigonometrical Survey *S. Prashant Kumar, Institute on the Formation of Knowledge University of Chicago*

All across central India, in states like Jharkhand, data centers which produce labelled text and image corpuses for artificial intelligence have begun to appear. While seemingly new, these sites bear an uncanny resemblance to colonial-era data gathering projects. In this talk I want to establish links between the present moment and an earlier, underexplored history of rationalised, machine-minding labor. I am interested in the "native observers" employed, during the colonial period, by magnetic and tidal observatories to record data. Under the Raj, surveyors and administrators used the term “native agency” to refer to work performed by Indians. If ‘native’ labour was necessary for operations, it was also suspect. One solution lay in differentiation. By the end of the 19th century, administrators had begun theorising the relationship between certain kinds of survey work and certain kinds of India n assistants. “Eurasians and Sudras” were most capable in the field, opined one surveyor, “being of flesh-eating classes.” Gradually, different groups became read as epiphenomena of invented traditions and histories. The use of the word agency in official reports of striking, especially since we now think of the word in almost emancipatory terms, as referring to the suppressed capacity for self determination under colonial rule. As I will show, the contradictions inherent in this project of mapping kinds of work onto kinds of people continues to have present day significance.

David Marr’s *Vision* and the Artificial Ways of Seeing *Sokion Choi, Seoul National University*

I aim to explore the significance of David Marr’s seminal work, *Vision: A Computational Investigation Into the Human Representation and Processing of Visual Information* (1982) in

the context of the history of artificial intelligence (AI). This will allow us to perceive the epistemological continuity between so-called GOFAI (Good Old-Fashioned AI) and today's machine learning. Trained as a neuroscientist, Marr joined MIT's Artificial Intelligence Laboratory in 1973 and stayed there until his death in 1980. *Vision*, Marr's *magnum opus* which compiled his lifelong research and published posthumously, is often respected as the foundational work in the field of computer vision. This book has always been at the summit of interest among philosophers, neuroscientists, and computer scientists; but it has not garnered the same degree of attention from historians of science. In this presentation, I investigate how Marr's theory of vision sophisticated by consolidating the conflicting perspectives of his time. Following his research crossing the Atlantic Ocean, I demonstrate that Marr's comprehensive theory of visual perception was a combination of cybernetics, neurophysiology, perceptual ecology, and artificial intelligence. *Vision* not only offered the "three levels approach" which separates the levels of computation, algorithm, and implementation, but also presented a framework which allows diverse ways of machine seeing to coexist. Shedding lights on the mediating façade of Marr's work, I challenge the purported discontinuity caused by the "neural net revolution", thereby alleviating the well-known antagonism between two paradigms of AI: the symbolic and the connectionist.

AI Winters and Moral Prejudice: Machine Learning, World Describing, and Discovery as a Political Activity ***Aaron Mendon-Plasek, Purdue University***

Carlo Ginzberg writes of his attempts "to understand what witchcraft really meant to its [sixteenth-century] protagonists" through the "discrepancies" of extant accounts composed by their antagonists. The efficacy of contemporary machine learning systems has analogously been narrated through the values, problems, and concerns of machine learning's 1980s antagonists. This paper argues that boom-and-bust narratives of AI are a spurious artifact of privileging groups of well-funded AI researchers to the exclusion of many diverse and heterogeneous communities who were AI's interlocutors in the US and across the globe. This reframing provides new insights into key debates in the history of science surrounding the circulation of knowledge practices. Next, in place of specific "AI winters," I show how late 20th century AI researchers can be better understood through a plurality of views regarding "machine learning" across a number of research communities. These non-monolithic and interdependent research communities were often working on entirely different problems, and their critiques of each other often amounted to disagreements about what kinds of problems (and political organizations) were valuable. Finally, in bringing these new communities into conversation with earlier AI histories, I demonstrate that the disunity of machine learning research in the second half of the twentieth century informed a range of neoliberal strategies aimed at guarding against personal and institutional self-deception, constrained the creation of metrics for evaluating scientific progress and novelty, and spurred twenty-first century reimagining of reason-giving in US law.

Chair:
Gregory Radick, University of Leeds

082. Women's Mentorship Event

Sponsored Roundtable
3:30 to 5:00 pm, Friday 8 Nov.
Holiday Inn: Lobby Level - Santiago

Join us for a relaxed, informal conversation! 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.

Chairs:
Iris Clever, University of Chicago
Claire Ann Votava, University of California, Los Angeles
Mary Kate Wolken, University of Minnesota

083. Historiografías del Sur

"Futures" Roundtables
3:30 to 5:00 pm, Friday 8 Nov.
Fiesta Americana: Lobby Level - Yucatan I

Recent global histories of modern science that start in the Indigenous territories today called Latin America and the Caribbean recognize that encounters in the region after 1492 fundamentally transformed practices of knowledge production and experimentation worldwide. In honor of the conference location in Mérida, Mexico, this Futures Roundtable invites HSS members without a specialty in Latin American history to join a conversation on Latin American and Caribbean historiographies of science, knowledge, technology, and medicine. Roundtable participants—historians and anthropologists of science

in Latin America, with positions in Australia, Chile, Colombia, Mexico, and the US academy—will discuss their practices and theoretical orientations and what these offer the history of science as a larger field. Hailing from a range of institutions, nationalities, and career stages, participants will speak directly to the matter of collaboration across North and South: what has worked, in terms of shifting perspectives; what is needed from colleagues within and beyond Latin America to strengthen the future of the field; but perhaps also what gets challenging when a more regional or global frame is adopted. As HSS celebrates 100 years with its first gathering in Latin America, this roundtable will suggest new directions that scholarship from, in, and outside the region can help chart for the society's future.

Chair:

Christopher Heaney, Pennsylvania State University

Participants:

Taylor Elizabeth Dysart, University of Pennsylvania

Christina Ramos, Washington University in St. Louis

Barbara Kirsi Silva, Universidad Catolica de Chile

Edna Suárez-Díaz, Universidad Nacional Autónoma de México

Lisette Varón Carvajal, Universidad de los Andes, Colombia

Sarah Walsh, University of Melbourne

084. Giving or Taking Psychology Away? Psy Sciences in Circulation

Roundtable

3:30 to 5:00 pm, Friday 8 Nov.

Fiesta Americana: Lobby Level - Yucatan II

In a 1969 speech, then-president of the American Psychological Association, George Miller, urged his colleagues to “give psychology away;” only by relinquishing control over how psychology is used could the field live up to its potential to promote “human welfare.” At the time, he did not contemplate, nor could he fully anticipate, the myriad forms through which psychological knowledge circulates within wider society. Since its birth in the 19th century, psychological expertise has taken on an important role in policies as much as in policing everyday life and politics. While historians of science have certainly contributed to a better understanding of the diverse modes, actors, and institutions involved in the circulation of psychological knowledge, many questions remain, especially regarding the roles of non-experts, professionals outside the field of psychology, and the general public. Psychological language has become so pervasive that it is now mobilized to make sense of most social phenomena. This underscores the need to give "applied psychologies" and "popular psychologies" more prominence in our histories. The circulation of the psy sciences will be evoked through several cases: the popularization of psychoanalysis in Chile (Ruperthuz); the transformation of the meaning and use of the notion of psychological boundaries (Morawski); the entanglement of clinical and non-clinical ideas and practices employed to promote and ensure psychological safety (Koch); the borrowing of the psychological concept of microaggression by other academic disciplines (Pache); and the contemporary and revisionist uses of neoliberalism as an analytic frame for psychologization (Davidson). The contributions will therefore illustrate how psychological knowledge became a legitimate form of expertise in the scientific, political, and public spheres, even as this knowledge was increasingly developed or repurposed and transmitted by non-psychologists. The roundtable will discuss this understudied aspect of the production and expansion of psy expertise, as well as the history of various modes of psychologization in the making of “therapeutic culture”. Mariano Ruperthuz will present in Spanish. Mariano Ruperthuz presentará en español.

Session Organizers:

Stéphanie Pache, Université du Québec à Montréal

Ulrich Koch, George Washington University

Participants:

Mariano Ruperthuz

Jill Morawski

Ian James Davidson, Concordia University of Edmonton

Ulrich Koch, George Washington University

Stéphanie Pache, Université du Québec à Montréal

085. Ottoman Science

Contributed Paper Session

3:30 to 5:00 pm, Friday 8 Nov.

Fiesta Americana: Lobby Level - Yucatan III

Participants:

Divine Blossoms: Cultural Significance and Symbolism of Tulip Cultivation in Early Modern Istanbul *Zeynep Kuleli, Johns Hopkins University*

This paper examines the profound cultural and symbolic importance of tulips in early modern Istanbul, exploring their ascent as the preeminent choice for cross-breeding, far surpassing the traditional favorite, the rose. This study investigates the question: How did tulips come to dominate the floral landscape between the mid-sixteenth and mid-eighteenth centuries? It shifts the discourse from conventional themes of economic value and horticultural practicality to delve into the deep-seated cultural meanings tulips held for

the Ottomans. Utilizing an array of horticultural and floricultural texts along with contemporary poetry, this paper seeks to contextualize the tulip within the Ottoman worldview. These literary and practical works demonstrate that breeders and enthusiasts attributed ideals of high culture, such as purity and cleanliness, to the tulip—traits symbolically reinforced by the tulip's necessity for clean soil and meticulous care. Moreover, given that the numerological value of the word "tulip" (lâle in Turkish) aligns with the Arabic numerals for Allah (66), tulips also embodied divine significance. This connection raises another intriguing question: In what ways did the religious symbolism associated with tulips influence their popularity and breeding practices? By focusing on tulips as a case study, this paper aims to uncover the intricate cultural and religious dynamics fueling the enthusiasm for tulip breeding in Istanbul. The findings promise to contribute significantly to our understanding of the intersections between botany and cultural identity, shedding light on how non-Western scientific traditions can enrich the broader history of science.

"The Desert Shall Blossom as the Rose:" Reexamining Eco-social Relations in Late Ottoman Iraq ***Daniel McAbee, Columbia University***

This paper explores late Victorian transformations in the arid ecologies and agricultural production of late Ottoman Iraq. Scholarship on this topic typically refrains from seriously engaging with long-standing ecological relations and productive practices, characterizing them as archaic vestiges of a pre-scientific period. Instead, the literature lauds imperial efforts to domesticate the Tigris and Euphrates river system and drain wetlands in an attempt to extend capitalistic cereal and date production using 'scientific' means. This alliance between imperial capitalist interests and scientific practice initiated a process of eco-social flattening in Iraq that has continued to today. This paper attempts, then, to recover some of these flattened spaces and their relations. As the world careens towards an uncertain future marked by interlocking ecological crises, imperatives to find alternative ways to articulate eco-social relations become increasingly unavoidable. The contrast between humanity's millennia-long habitation of the Tigris-Euphrates region and the region's impending habitability crisis measured in decades puts in stark relief wider questions about humanity's place on the planet. Using recent insights from critical ecology and STS to engage with imperial projects and the traces of overwritten long-standing practices, this paper considers what scholars miss when we casually dismiss long-standing, locally situated ecological practices and laud supposedly universal 'scientific' practices. It also considers avenues to reconcile the sustainability of these long-standing practices with the fruits afforded by modern techno-scientific capacities.

"Doctor Röntgen's Discovery Still Occupies the Public Mind!": Imagining X-rays in the Late Ottoman Empire ***Baek Kyong Jo, University of Toronto, Canada***

News of the X-rays' discovery in 1895 quickly spread to the Ottoman Empire, igniting widespread curiosity among its populace. Illustrated journals enthusiastically discussed the rosy future that this groundbreaking technology would bring, pouring out articles with awe-inspiring X-ray images. X-rays quickly became a popular visual and literary motif among Ottoman intellectuals; not only were they discussed in scientific journals, but they were also invoked in political critiques, theatres, and even romantic ballads. This presentation examines the early experiences and popular imaginations of X-ray technology in the late Ottoman Empire, tracing how they were shaped within the turbulent sociopolitical atmosphere of this period. I analyze how Ottoman officials, intellectuals, and the broader learned public constantly interpreted X-ray technology to their own values, needs, and social outlook. They associated X-ray's status as an epitome of modern sciences and its uncanny ability to penetrate matters and bodies with numerous aspects of Ottoman society, which was undergoing radical changes: the influx of Western culture, medicine, and sciences, the state's visual encroachment into human bodies, and many more. By exploring various cultural representations of X-rays, this presentation attempts to show how technology and expectations over it take their specific shapes in a dynamic interaction among society.

The Ottomanization of Pasteur: Interrogating Pasteur's Relationship to the Ottoman Empire & reframing the History of the Imperial Institute of Bacteriology in Istanbul ***Christin Zurbach, University of California, Berkeley***

This paper examines the relationship between Louis Pasteur and the Pasteur Institute in Paris and the Ottoman state and the researchers and physicians it employed. Towards the end of

Pasteur's life, Sultan Abdulhamid II sent a commission – physicians Dr. Alexander Zoeros Pasha and Dr. Hüseyin Remzi and veterinarian Hüseyin Hüsnü - to Paris in late 1886 to observe techniques in immunization against rabies and anthrax from Pasteur's laboratory. Zoeros knew Pasteur prior to the visit and continued to correspond with him until his death, which, along with the financial contributions by the sultan, facilitated the trip. Upon the Ottoman researchers' return to Istanbul, they established the Institute of Bacteriology that employed both Ottoman and French researchers who researched and produced vaccines and offered courses to local medical and veterinary students. The collaborative nature of this institution meant it maintained ties to the Pasteur Institute in Paris while also being deeply intertwined with Ottoman public health councils and medical institutions. I argue that exploring the connections of the Istanbul Institute of Bacteriology to Pasteur and the Pasteur Institute can reveal a great deal both about the history of microbiology and medical institutions in the Ottoman empire and of Pasteur and his affiliated institutes around the world, as well as the colonial and decolonial implications of these institutes. I also continue this study past Pasteur's death and into World War I, during which the Ottoman empire and France were on opposing sides, and how the war impacted the institute's operations.

Chair:
Sahar Bazzaz, College of the Holy Cross

086. Biomedicine

Contributed Paper Session
3:30 to 5:00 pm, Friday 8 Nov.
Fiesta Americana: Lobby Level - Yucatan IV
Participants:

A Social History of Staining Techniques in the Heroic Age of Cytology, 1873–1899 ***Daniel Liu, Historisches Seminar der Ludwig-Maximilians-Universität München***

The discovery of the chromosomes, mitosis, and mitochondria—in the 1870s, 1880s, and 1890s, respectively—are the best known results of two technical revolutions in microscopy. The first, the Abbe-Helmholtz definition of diffraction-limited optical systems, led to the microscope becoming a solved problem by the 1880s, such that biologists ceased worrying about optical distortions. The second, the boom of the modern chemical industry, made dozens of new chemical reagents available for histologists for use in making specimen preparations—with synthetic coal tar stains alone growing from one in 1862 to over 66 "commonly used" in 1898. Unlike the optical revolution, however, each new chemical reagent made it possible to create new artifacts and errors, as well as to reveal hitherto unseen structures—an epistemological feature of preparation technique that has long been noted by Ian Hacking, Hans-Jörg Rheinberger, and Jutta Schickore. But how did microscopists decide what preparation methods created facts, and which created artifacts? In this presentation I will draw on Carin Berkowitz's concept of the "system of visual display" to argue that late-19th century microscopy had a distinct social structure within which microscopists adjudicated debates about methods. To show the elements of this system I will present data on an extensive survey of microscopy manuals, as well as biographical sketches and microscope images. I will also argue that all microscope images, from schematic sketches to photomicrographs, should be interpreted by historians not just as representations of objective facts, but as arguments among microscopists within this social-visual system.

The DNA of Bacteriophages: The Role of Genetics in Soviet Microbiology ***Miriam F. Lipton***

The 1969 Nobel Prize in Physiology or Medicine which used bacteriophages, a kind of bacteria-eating virus, to show how cell replication works had two simultaneous consequences; it convinced scientists around the world that bacteriophages were an ideal research organism, thus launching the field of genetics; and it effectively muted any Soviet global accolades into bacteriophage research as a therapeutic organism. Decades before the 1969 Nobel prize, Soviets had used bacteriophages therapeutically to treat bacterial infections with little international recognition. They did not use them for genetic research because of a government policy that promoted neo-Lamarckian thinking and banned Darwinian research. The 1969 Nobel Prize, therefore, was professionally devastating for Soviet microbiologists, because despite nearly 40 years of bacteriophage research they had not conducted any bacteriophage genetic research, which meant they completely missed out on the potential to use genetic bacteriophage research to their advantage. Partly due to the difficulty accessing

Russian-language sources and the skill needed to translate such documents, there has been a dearth of historic work into Soviet experiences with bacteriophages, and the field of Soviet microbiology more broadly. My paper seeks to remedy this. Through an assemblage of fellowships and grants, I have collected nearly every Russian language scientific article on bacteriophage genetics from the Soviet Union. Using these sources, I will explore how the Soviets understood bacteriophage genetics, and how they tried to co-opt that research for their own gain. This paper will also touch on concepts of scientific primacy and legitimacy, politics, and scientific agency.

The "Biological Time Bomb": Imagined Futures in the Life Sciences, 1960s - 1980s ***Christina Brandt, Friedrich Schiller University***

In the 1960s and 1970s, new experimental objects such as the “genetic code”, “clones”, “recombinant DNA”, embryos and genetically modified organisms were at the center of public debates. By comparing developments in the U.S. and Germany, I explore how these research fields gave rise to controversial imaginaries of the future: from far-reaching visions of future applications of biotechnologies to scenarios of future societies. In the first part, I will focus on the 1960s, a period often characterized by postwar ideas of modernity. Molecular biologists distanced themselves from older eugenicists’ approaches, but at the same time they promoted far-reaching speculations about how the “new biology” would shape future societies. "The Future of Man" was a central theme of science fiction and popular science books, and leading biologists (e.g. Joshua Lederberg), developed utopian visions of the future impact of the life sciences on society. In Germany, these debates were received as biopolitical dystopias. The second part analyzes how controversies over genetic engineering, embryo research, and cloning reached a first peak in the 1970s and early 1980s when ideas about the future applications of new biotechnologies turned into dystopian views in the public debates and new approaches of risk assessment, bioethics and science regulation policy developed. These future imaginations are analyzed in the context of broader social, political, and economic transformations that took place in the 1970s, a period that is described as a turning point and fracture zone of modernity, characterized by the loss of utopia and a widespread sense of crisis.

Chair:
Nick D Hopwood, University of Cambridge

087. HSS Distinguished Lecture: A scientist walks into a country...: Experiments and the Politics of Development Aid

Plenary Session
5:15 to 6:45 pm, Friday 8 Nov.
Fiesta Americana: Lobby Level - Yucatan I

Presenter:
Gabriela Soto Laveaga, Harvard University

088. HSS Centennial Banquet

Reception
7:00 to 9:00 pm, Friday 8 Nov.
Quinta Montes Molina

Session Organizers:
Edna Suárez-Díaz, Universidad Nacional Autónoma de México
Gisela Mateos, Universidad Nacional Autónoma de México

SATURDAY, NOVEMBER, 9

089. Women's Caucus Breakfast
Breakfast
7:00 to 8:00 am, Saturday 9 Nov.
Fiesta Americana: Lobby Level - Stelaris Bar

090. Multidisciplinary Approaches to the History of Chemistry. Panel 1: Digital Humanities and Philosophical Perspectives to the History of Alchemy and Chemistry
Organized Session
8:00 to 9:30 am, Saturday 9 Nov.
Fiesta Americana: 1st Floor - Izamal I
This panel is part of a three-panel session on Multidisciplinary approaches to the history of chemistry. A central task for the history of chemistry is to understand the processes that have promoted an exponential expansion of chemical knowledge over the past two centuries, while creating a discipline that exhibits a vast, multifaceted range of interactions with its social context. Lying at the border of academic science and industrial technology, chemistry produces both major benefits and risks for society and has dramatically shaped the disposition of the world's resources. The analysis of the processes that have created modern chemistry is now nuanced by the increasing amount of historical data and computational power, which provide an opportunity for multidisciplinary approaches to the history of chemistry. In fact, new insights on the history of chemistry and new methods and tools for its practice are emerging from scientists and scholars from mathematics, computer sciences, physics and linguistics, among other disciplines. These multidisciplinary approaches do not come alone, but are enriched by the epistemic frameworks of each contributing discipline, which nuance those of the history of science. The aim of the proposed session is to bring historians and practitioners of these multidisciplinary approaches to the history of chemistry together to contrast their results and methods, and to promote a multidisciplinary dialogue for the sake of the history of chemistry. We believe that through this discussion, researchers and scholars can gain a more holistic understanding of complex historical phenomena and can also avoid oversimplifications or biases inherent in single-discipline approaches. We are, in particular, interested in addressing the following questions: What specific questions can be resolved by the multidisciplinary approaches to the history of chemistry and which cannot? What is the role of formal models in historiographical narratives? What is the appropriate coarse-graining level for the history of chemistry, and to what extent can this level be addressed by different disciplines? Can multidisciplinary approaches help link macrohistory with microhistory? What formal models are most suitable for historiographical research? What are the disciplinary challenges posed by the history of chemistry? This session houses contributions from researchers across various disciplines in the history of science, as well as in chemistry, computer science, life sciences, linguistics, mathematics, philosophy and physics. By fostering collaboration among diverse fields, we aim to gain comprehensive insights into the multifaceted nature of the historical unfolding of chemistry. Moreover, our panellists align very well the diversity HSS guidelines in terms of "gender, career stage/track, geographical location, and institutional affiliation." This session is co-sponsored by the HSS Forum on History of Chemistry, the Commission on the History of Chemistry and the Molecular Sciences and the Society for the History of Alchemy and Chemistry.
Participants:

Discovery, Innovation and Technology in Science: Geochronology and the Ontology of Scientific Methods ***George Borg, University of Pennsylvania***
This project takes an integrated HPS approach to analyzing the 20th century history of geochronology, the branch of geochemistry devoted to the dating of geologic objects. Philosophers of the historical sciences have focused to a significant extent on the problem of epistemic access facing these sciences: how do historical scientists overcome the relative scarcity of data about the past, compared to the present? Solving this problem requires solving another one, the 'problem of ontic access:' how do historical scientists get access to entities and processes with properties that are potentially informative about the past? The case of geochronology illustrates one solution to this problem: historical scientists can get access to entities and processes potentially informative about the past by exploiting the metaphysical structure of their domain. Beginning as the geological endeavor to quantify geological time-periods, during the 20th century geochronology was revolutionized by the discovery of radioactive decay and the importation of mass spectrometric techniques from physics. As a result, it experienced an explosion of its research boundaries in the 20th century. I explain this productivity by analyzing the ontology implicit in the new techniques. The productivity of isotope geochronology was based on (a) mereological decomposition in order to (b) exploit differences of properties between the parts and the whole, and (c) an exceptional complementarity between mass

spectrometry and lower-level properties, allowing application to a wide range of geological contexts. The technologically mediated ability of the scientists to exploit the metaphysical structure of their domain was crucial to their success.

The End of Chemistry as a Discipline, Subdisciplines Take the Power ***José Antonio Chamizo, Universidad Nacional Autónoma de México***

In the mid-18th century, chemistry emerged in Europe as an independent discipline, with strong and stabilized shared, academics and industrial, practices. Despite this stability, its epistemic foundations remained unsettled. In the first quarter of the 19th century chemistry underwent four major transformations, characterized by the appropriation and accumulation of new “hidden entities,” ranging from the ontological to the socio-epistemic, namely chemical atoms and the emergence of subdisciplines such as organic chemistry, physical chemistry, instrumental chemistry, and organometallic chemistry, among others. I argue in this paper that the quest for a firm epistemic footing spurred the development and empowerment of these subdisciplines within chemistry. Today, these subdisciplines resemble the independent and stable 18th century chemistry, with strong academic and industrial practices. Elaborating upon the historical branching of chemistry, I analyse methodological and epistemic distinctions among the emerging subdisciplines, which range from scientific language to practices. I also discuss the still common chemical background of these subdisciplines by making emphasis on the fundamental role of analysis and synthesis. I conclude the paper by discussing whether this tension between the disciplinary branching holding a common background may be regarded as the end of chemistry.

Towards a Computational Historiography of Alchemy and Chymistry ***Sarah Lang, Graz University***

Ongoing digitization offers unprecedented opportunities to complement the historiography of alchemy through computational methods. This talk examines how interdisciplinary collaboration between historians of science, computational scientists, and digital humanists can provide a more nuanced understanding of chymical practices of the early modern period in computational exploring microhistorical details as well as macrohistorical trends. Using examples such as applying Large Language Models to the digital analysis of early modern books of secrets or applying Computer Vision and Object Detection of illustrations of early modern metallurgical apparatus, we explore the potential of digital scholarly editing and the innovative use of computational tools in analyzing historical alchemical texts. Computational methods, in this framework, are not supposed to supplant traditional approaches but rather complement them. For instance, digital editions can facilitate a granular analysis of textual variations and experimental reconstructions, while computational methods such as stylometry and machine learning can offer insights into authorship and the classification of alchemical apparatus. These computational techniques not only advance our understanding at a microlevel but also contribute to a broader macrohistorical narrative when taken as a whole. This talk will critically assess the role of computational tools in historiography and their capacity to redefine traditional narratives in the history of alchemy and chymistry.

An AI-Assisted Iterative Approach to the History of Alchemy ***Farzad Mahootian, New York University***

Before making sweeping statements about the history of alchemy, we must conduct thorough investigations into non-European alchemical literature. Many of these texts remain untranslated and even unclassified, making it challenging to draw global conclusions. To address this, I suggest initially classifying them based on the standard divisions of contemporary alchemical studies, such as "laboratory-oriented" versus "philosophical" alchemy, despite recognizing the limitations of this approach. Quantitative analysis of this literature could justify the significant effort needed for digitization, with advanced textual analysis techniques becoming crucial for this task and with current methods already yielding promising results. Even an approximate classification would be a valuable starting point, potentially spurring international collaboration for further research into diverse cultural perspectives on alchemy. How might a multi-disciplinary team of programmers and humanists frame an AI-assisted history of alchemy? Could we find an entry point by pursuing hybrid models of inquiry toward a common goal of improving tools for quantitative scholarship in the history of alchemy? These

questions led me to undertake collaborations with the Max Planck Institute (MPI-Leipzig) and New York University (Abu Dhabi and New York). Our methods have yielded a ML approach that measures various characteristics of nearly 200 alchemical texts of the 17th century and tracks their changes over time. MPI previously analyzed the rate of knowledge production throughout 19th-20th century chemistry and measured the impact of wars and pandemics with unprecedented quantitative precision. I propose to develop analogous methods for alchemy's history by adjusting relevant analytic methods and research questions.

Session Organizers:
Guillermo Restrepo
Jeffrey Allan Johnson, Villanova University
Brigitte Van Tiggelen, Science History Institute

Chair:
Guillermo Restrepo

091. Fiber Histories

Organized Session
8:00 to 9:30 am, Saturday 9 Nov.
Fiesta Americana: 1st Floor - Izamal II

Fibers have been spun, woven, and combined to create materials essential to life throughout human history. Plant fibers like cotton and hemp and animal fibers like silk and wool have been recognized as mediums of industrial and cultural production, from cordage and textiles to absorptive and binding materials. The matters that concern fiber-related researchers span from the microscopic properties of protein and cellulosic fiber sources to the aesthetics of fabric and their consumption as fashion. However, between the scalar extremities of the elemental and the representational, fibers—the threadlike molecular forms that can be manipulated to create even larger forms—themselves are often overlooked. Such attention emphasizes the numerous untold stories about the material properties of the fibers that deserve greater historical analysis. This panel seeks to articulate critical fiber studies as a viable mode and vital field of inquiry by featuring four overlooked fiber histories in cross-disciplinary conversation: catgut derived from animal intestines; regenerated peanut protein fibers; agave leaf fibers called henequén; and silk in biomedicine. These cases stitch together insights and methods from studies of material culture, museum conservation, nutrition, medicine, colonial science, the history of technology, and economic history by highlighting fibers as their common material substrate. This will allow the panel to foreground the mediality of fibers and their specific properties across use cases, including visibility, fungibility, tactility, durability, and degradability. Doing so will demonstrate how studying fibers can unsettle our traditional categories of analysis, such as the conceptual division between plant and animal studies, entwining new historical connections and narratives of the present.

Participants:

From Strings to Stitches: Catgut as Medical Technology ***Isabela de Oliveira Dornelas, Max Planck Institute for the History of Science***

Catgut, a natural fiber known for its exceptional elasticity and durability, is derived from the intestines of animals such as cattle, goats, pigs, or sheep. It has been extensively utilized in stringed musical instruments, sports rackets, and clock strings, and has been a well-known suturing material since ancient times. In the late nineteenth century, catgut began to be used in medical practice on an increasingly larger scale, revolutionizing internal organ surgery. Catgut's unique capacity to dissolve within the human body made it a game-changer for obstetric surgery, effectively addressing the challenges posed by the womb's thick muscle tissue. This tissue presented a unique challenge because it is thick, and not all suturing materials could adequately close it. Additionally, materials that were suitable for suturing the thick muscle tissue were often non-absorbable, requiring a second surgery to remove the stitches, thus increasing the risk of infection. However, with the mid-nineteenth-century revolution in hygiene, strict protocols for cleanliness and sterility posed a challenge to the use of catgut as a surgical material. The challenge of sanitizing catgut by worldwide laboratories was a crucial step towards making it safe for use in human bodies by eliminating the risk of infections. This paper delves into the historical tension between the selection of animal body parts for surgical materials and medical practice in the early twentieth century. More specifically, it explores how medical practice exploited bacterial culture to test the sterility of catgut. The research also examines the arguments in favor of absorbable materials like catgut over non-absorbable materials like silk, shedding light on the scientific debates of the era.

Inventing Fibers, Substituting Proteins ***Erin Alexa Freedman, Harvard University***

The mid-twentieth century gave rise to new kinds of commercial substitutes. Unlike surrogates that displaced on the basis of comparable sensory and nutritive qualities, or

artificial “patent” materials designed to mimic and democratize luxury products, these substitutes were polymorphous and versatile. Though synthetic nylon derived from petrochemicals first appeared as a replacement for silk in hosiery and surgical thread, it was never intended to simulate the natural fiber. A peerless plastic-elastic medium, nylon could assume an endless variety of forms and properties in combinations that exceeded any one natural referent. This paper explores a contemporary of nylon, a British fiber called ‘Ardil’ spun from the regenerated proteins of West African peanuts. Rather than displace wool, Ardil was designed as a supplement to re-stimulate demand in the national fabric by weightlessly imparting wool’s signature warmth, softness, and crease resistance into fabrics of every kind. Ardil’s simulation of wool properties hinged on a structural homology between seed proteins and mammalian hairs. This discovery made by interdisciplinary protein researchers and materialized by chemical industry opened peanuts, a century-old substitute for animal oils and fats, to new forms of material and colonial exploitation. Setting Ardil within the context of intensified British extraction of plant resources from the global south, I examine how the invention of artificial protein fibers was enmeshed with the nutritional revaluation of plants as protein-rich foods. In this period, the protein basis of subsistence materials brought textile research and nutrition science, biochemical knowledge and food policy, into new historical alignments.

Henequén: A History of Agave Fiber Decortication Technology ***Michelle Ha, Stanford University***

Agave fibers commercially sold as “henequén” are considered the “green gold” of Mexico’s Yucatán Peninsula that ushered in the region’s nineteenth-century gilded age, the legacy of which is highly visible in our conference host site, Mérida. Henequén was sought after by imperial actors since the Spanish colonial era for a variety of strategic materials, including maritime cordage and binder twine for agricultural harvesting machines. Economic histories of the Yucatán Peninsula and commodity histories of henequén generally assert that the development of decorticating machines that could efficiently scrape pulp from agave blades—the most labor intensive and costly part of the fiber extraction process—allowed for henequén production at scale and were thus pivotal in the Yucatán’s transformation into a lucrative agave fiber monocrop economy. This paper takes up the assumption that mechanization increases efficiency in production as a question for further study, foregrounding considerations of what gets produced and how that product is selected among competing alternatives. Contextualizing henequén within the longer histories of agave fiber decortication tools and techniques and the broader social and cultural horizons of the worlds in which such technologies were engineered and practiced reframes the history of the Yucatecan agave fiber industry as one in which a narrow capitalist agenda catering to the demands of the global hard fibers market was prioritized at the expense of other competing manufacturing knowledges and practices, including Indigenous traditions and lifeways. This study thus presents a history of henequén’s transformation into an industrial coarse fiber and raw material.

Testing Invisible Threads ***Lisa Onaga, Max Planck Institute for the History of Science***

Silk threads spun by the caterpillars of silk moths have been used by humans for crafting and manufacturing myriad kinds of objects in history, ranging from clothing and lavish tapestries, to utility objects and the hair of dolls. Less apparent are the uses of silk threads in surgery, or their use more recently in the fabrication of woven vascular prostheses, not least of all because these things were not intended to be seen, even if relatively long-lasting. By pursuing a history of the "invisible thread," this talk traces the processes by which the technology of surgical silk sutures became increasingly scientifically known during the late twentieth century. The transformation of analytical repertoires of studying materials in scientific professions such as museum conservation provides important hints about the history of testing that is entwined with the history of standardizing textiles. An understanding of the elaboration or superfluousness of these tests to ascertain the properties and effectiveness of silk sutures in the prevention of sepsis as well as other objects that require preservation is critical for furthering an contextual understanding of the ongoing uses of silk in the fabrication of replacement tissues in mammalian bodies.

Session Organizers:

Lisa Onaga, Max Planck Institute for the History of

Science
Michelle Ha, Stanford University

Chair:
David Pretel, Universidad Autónoma de Madrid

092. At the Crossroads of the History of Music and History of Science

Organized Session
8:00 to 9:30 am, Saturday 9 Nov.
Holiday Inn: Lobby Level - Maya

Music has often played a crucial role in scientific thought and practice. To give just two examples: in modern cosmology and natural magic, because of its digital nature; in medicine, because of its supposed capacity to alleviate ills or, conversely, to make one ill. Through music it is also possible to explore ways in which embodied knowledge circulates, how it defines sexual and cultural identities and subjectivities, etc. The epistemological potential of music lies also in its power to trigger emotions and conduct. We need only recall the supposed power of siren songs to bewitch seamen, of baroque polyphonic compositions to provoke mystical raptures, of lullabies to alleviate mental illnesses. This panel aims to explore the ways in which the history of music helps us to address complex problems in the history of science. For example, how can music help us to understand the role of the senses and emotions in the production of knowledge? How might the intersections of the history of science and music serve to understand historical modes of hybridisation and circulation of knowledge? How can hearing be used as an alternative to sight for tackling issues of expertise, objectivity, or attention? Although scholars have already begun to explore some of these questions, a deeper methodological discussion is needed to address how music, something that permeates all layers of society, could effectively serves in the history of science.

Participants:

Writing the History of Music Designed to be Ignored: Sound Affects from Edison to Spotify ***Alexandra Hui, Mississippi State University***

In this paper, I trace out the history of the science of background music, designed to be applied to listeners' bodies and mind often at or just below the threshold of attention. Using examples from music in industry, Muzak in public spaces, and ambient music and nature records of the 1970s, I document the mechanisms through which sound engineers shaped and standardized listener experiences. Much of the efficacy of this music as applied science depended on listeners' inattention to it. Considering sound and music as applied science, in turn, allows us to treat them as world-making technologies. And yet, despite the ubiquity of these sounds, the experience of them is tricky to find in the archives. Where can we find affective experiences in the archival record, especially those prompted by technologies/phenomena created to obscure themselves? How might we "sense against the archive"? Because the subjects of these sound applications were also consumers actively marketed to, subject-object, scientist-public binaries break down. More generally, examining the liminal soundscapes of background music motivates us to think carefully about whose attention we attend to — the scientists or the subjects of their science — and how not just epistemological frameworks but phenomenological ones are formed.

Avian Voices: Nature and Music in the Early Modern Ibero-American World ***Tasio Rodrigo, Institute of History of Science, Universidad Autónoma de Barcelona***

One of the earliest examples of birdsong transcription is found in Athanasius Kircher's Musurgia Universalis (1650), an eclectic compilation of themes regarding musical thought. This book exerted significant influence on music treatises, particularly in the Iberian Peninsula and colonies. The transcription of nature into Cartesian diagrams of duration and pitch (scores) became a widespread practice. Through the rationalization and classification of sound, it arguably served as a way of conquering not only landscapes, but also soundscapes. However, the possibility of capturing birdsongs in arithmetical language was controversial. Some argued against, since bird soul and chant pertained purely to the senses. In addition, the very nature of music was in question: Was music encoded in the numbers of the "music of the spheres" or did it share a mutual origin with language and the affections of the body? Focusing on bird songs, this paper will explore these debates on music in nature and on the nature of music in the colonial context to illuminate the evolution of the relationship between humans and animals and the role of senses and emotions in knowledge production

Musical Bodies: Knowledge, Senses and Emotions in Eighteenth-century Hispanic World ***Elena Serrano, Institute of History of Science. Universitat Autonoma de Barcelona***

This paper explores the role of music and musical practices in the production of scientific knowledge about the body, in particular, about the workings of the senses and the origins of

emotions. Eighteenth century music offers a good example of the intricacies of the senses and their relations with emotions and sexuality. It is not only apprehended by the sense of hearing, but it also speaks to the haptic nature of sound and its intertwining with sight. Furthermore, music, more than any other arts, was supposed to move affections and passions, provoking such variegated states such as sadness, joy, erotic pleasure, and communion with God. In short, if we consider music as a technology (with its experts and languages, instruments, visions, ideologies) that inter alia claims to affect emotions and wills, what ideas about the body and its passions were presupposed? The paper will thus bring into dialogue works on music and related genres (such as musical treatises, musical compositions) that circulated widely in the Hispanic context with medical and philosophical treatises and practices of musical healing. The ultimate aim here is to explore to the role of intersensory, affectional, and gender experiences in the production of knowledge.

Session Organizer:

Elena Serrano, Institute of History of Science. Universitat Autonoma de Barcelona

Chair:

Edward Somerville, Institute of History of Science. Universitat Autonoma de Barcelona

093. Visual Cultures of Science

Contributed Paper Session

8:00 to 9:30 am, Saturday 9 Nov.

Fiesta Americana: Lobby Level - Salon Celestun

Participants:

Visualising Climate: Exploring Met Éireann's Visual Culture *Katerina Eva Zouboulakis, Trinity College Dublin*

Visual material is embedded in the nature of climate science and meteorology- yet it has been largely ignored in studies of the history of this field. Visuals provide scientists with the opportunity to develop and share their knowledge, but they also highlight the nature of the science itself. When organisations prepare materials about themselves, they inevitably reflect inward and produce an artefact of their understanding of the institution, influenced by their own biases. These artefacts can be interrogated to reveal information about the state of the scientific agency at the time, but they also reflect the key relationships that will determine the future of that organisation. This paper seeks to explore three key diagrams from the Irish Meteorological Service to highlight how scientific knowledge was created on an institutional level; how scientists interacted with each other; what demands there were on the agency; and how these demands were met. This material exposes an unusual relationship between the Irish and British Meteorological Offices, which were closely linked for decades. This paper also touches on the physical locations and their impact on the Meteorological Service, from their decentralised nature in their first fifty years, to their first built-for-purpose headquarters opened in 1979. Exploring the visual materials published across the history of this organisation will shed light on their development into a modern scientific agency, while decentralising and decolonising the narrative of the history of meteorology and climate science to reflect the role of a smaller nation like Ireland.

Objectively Visible: (Re)presenting Anatomy through Illustration in the Age of Photography. *Sookyong Ko, University of California, San Diego*

How do we objectively represent an invisible subject in the production of scientific knowledge? With human anatomy, where the represented subject is naturally invisible to many readers, visual representations not only represent the internal structure of humans but in practice stand as a presentation of the invisible. To make this representation objective, anatomists of the early modern period developed naturalist techniques to portray with detail what is in front of them. Modernists adopted mechanical representation technology – such as photography – which in turn served as an empirical foundation for the study of medicine as a positive science. The optical ideals of witnessing have been refined through the developments in medical imaging technology through X-rays, CTs, and MRIs. Why do we, then, still use illustrations? This paper brings attention to a particular period when the newly developed technology of photography started to take over the duty of (presumably) faithful representation in medical publication (1850-1940). Noting that drawn illustrations continued to be of importance – especially so in educational publications – this paper finds that the visual rhetoric of reality in modern medical science is founded upon this complex of figurative illustrations and mechanically reproduced images: objective visualization achieved through the virtualization of instrumentally objective images. Locating this visual assemblage in the rich history of

illustrative medical art where the visual composition of human anatomy was often curated with heuristic intent, this paper puts forward a broader argument on the virtual optics developed through this juxtaposition that would signal the ways of seeing current virtual imaging technology endorses.

"Your Baby Is the Size of a Kumquat": Verbal and Visual Similes for the Scales of Human Eggs, Embryos, and Fetuses ***Nick D Hopwood, University of Cambridge***

Historians know much about cultures of measurement. Practices of comparing are attracting attention. Yet there remains much to discover about the uses of similes to anchor the sizes of unfamiliar things. Take a 2021 email from BabyCenter.com, the pregnancy and parenting website, which stated "You're 10 weeks pregnant! … Your baby is barely the size of a kumquat" above a drawing of an embryo and a photo of an orange fruit. The talk will show how, from 1997, investment in fetal patients and commercial pressures on digitally mediated pregnancies made consuming weekly fruit-and-vegetable sizes from poppyseed to pumpkin a standard part of the experience. It will place this recent change in a history of how, in training midwives and advising pregnant people in English and German since early modernity, words and pictures have conveyed the scales of human eggs, embryos, and fetuses. Representations of their growth have become central to the dominant account of human origins, alongside (another story) their development. Politics of food and reproduction explain the diversification of verbal comparators from ants and bees, barleycorns and pins. The introduction of visual similes ("objects for scale") participates in a general shift, but this is only in part a tale of increasing visualization. Similes still rely on words, typographical ones ("no bigger than the full stop at the end of this sentence") save on illustrations, and pictures may merely call an object to mind or invite the viewer to play.

Changing Approaches to the History of Science: Using Visual Methods to Address Women in Science ***Serenity S Sutherland, SUNY Oswego; David Ragnar Nelson, American Philosophical Society***

The turn towards digital methodologies offers historians of science alternative modes of doing history, contributing new approaches to current problems. For example, the digital project Visualizing Women in Science highlights the tension between famous scientific "heroines" and the networks of individuals who worked alongside them. The project pushes beyond traditional modes of inquiry (e.g., the monograph) by utilizing a visualization that seeks to answer the following questions: What counts as scientific work? Who is excluded from traditional accounts of scientific labor? How can visual approaches address marginalized narratives in the history of science? To address these questions, this project uses the collections of five women scientists at the American Philosophical Society: Florence Sabin, Florence Seibert, Barbara McClintock, Rose Mooney Slater, and Mildred Cohn. The project contextualizes these five women in the history of science by combing their papers for women scientists on the margins of the field. The network visualization documents nearly 500 relationships between women of science. A short biography is provided for each woman, accessible directly from the visualization. These biographies move the project beyond the "heroine" model of women in science by looking at women excluded from traditional biographies. The project provides fertile ground for thinking not only about how to represent histories of science differently, but also how to use archival collections to tell new, accessible narratives. Reading collectively through the archive affords researchers access to a broader field of actors, including fellow scientists, contingent faculty, research assistants, administrators, research subjects, and technologies, thereby broadening who is included in the work of science.

Chair:

Agustí Nieto-Galan, Universitat Autònoma de Barcelona

094. Changing Places, Realigning Knowledge: Twentieth Century Aquatic Biology in East Asia and Beyond

Organized Session

8:00 to 9:30 am, Saturday 9 Nov.

Fiesta Americana: Lobby Level - Salon Mérida

The twentieth century intensification of imperialisms in East Asia saw concurrent growth in limnology, marine biology, and associated disciplines. The resultant scientific, political, and cultural forces facilitated the translocation and tracking of aquatic species and their stewards. This panel explores four cases of such movements that led to new knowledge production, cultural practices, and ecological and conservation issues. Liu and Shi examine attempts to transplant

seaweeds to China's neighboring seas, most prominently off Shandong coast, tracing their origins to Japanese oceanic imperialism. Liu investigates how colonial era Jeju female divers' knowledge and labor advanced transfer of Korean islands' species and traces the pursuit into the postwar years. Shi scrutinizes socialist China's state-led development of cold-water kelp farms in warmer seas as carryover of Japanese era research. Both endeavors led to shifts in aspects of Chinese foodways, the regions' phytogeography and ecologies, and more. Yoshikawa focuses on the reconciling of research as decolonization stripped Imperial Japan's coral biology scientists of research sites. Repatriation from colonial imperial university and the loss of most (sub)tropical territories left some of the field's leading experts scrambling to find ways to sustain their research or alternate topics. Luk studies the uninhibited spread of freshwater jellyfish from its indigenous habitat in the Yangtze basin to its almost cosmopolitan presence today. Embraced and dubbed a critically endangered "living fossil" by Chinese media, the species is shunned elsewhere as excessive and invasive, resulting in a conundrum for its conservation prospects. The papers together seek to engage how larger forces of flawed past and present human political constructs, such as imperialisms and nationalisms, shaped human knowledge production and created uncertain futures for the species or their custodians, and in some cases, for the larger planet.

Participants:

Unknown Technicians in the Undersea Laboratory: Jeju Haenyeo and Marine Species Transplantation in the Yellow Sea, 1935-1944 ***Rui Liu***

This paper aims to shed light on the experiments conducted by Jeju Haenyeo in the Yellow Sea and the transfer of marine species from Korea to China. Jeju Haenyeo were female divers who were experts in diving into the bottom of the sea and catching abalones, trepangs, and seaweeds around the Jeju Islands. From 1935 to 1944, hundreds of them transferred from Jeju to Qingdao for marine species transplantation and domestication experiments due to Japan's oceanic imperialism. During this period, the Yellow Sea became a natural undersea laboratory most accessible to Jeju Haenyeo. They carried out benthos from seabeds around Korea (Jeju Islands mainly) to the Shandong Peninsula. Haenyeo observed, touched, and cultivated seaweeds, abalones, and trepangs. Their experiments led to reshaping population distributions and ecological systems in the Yellow Sea. The transplantation of seaweeds (sea mustard, agar) changed the food system in China. After 1945, Chinese divers, fishers, and scientists continued to transplant and domesticate these seaweeds from the Shandong peninsula to the East China Sea and beyond, making seaweeds popular foods in East Asia instead of luxury goods. Especially in the early postwar period, the Chinese government tried to take Sea Mustard as a replacement for Kelp, which was still in the process of the experiment. By exploring the role of indigenous knowledge and integrated skills of Haenyeo in establishing benthos in China, this paper would like to examine the participation of technicians (colonial, female, traditional technicians, etc.) as "nerve endings" in the production of aquatic biology in the twentieth century.

Marching Kelps to the South: Farming Saccharina japonica on the Shandong Peninsula (1939-1958) ***Aijie Shi, University of Wisconsin-Madison***

Saccharina japonica, known as konbu in Japanese and haidai in Mandarine Chinese, is a species of brown algae that originated in the waters of sub-frigid zone, where water temperature rarely hits 15°C. As its commercial potential in the chemical industry was unlocked in the early 20th century, it had become the subject of constant experiments of Japanese scientists along the coast of Asian waters for its maximum production, especially in the hope of expanding its cultivation to warmer waters in the south. Though Japan's defeat in WWII squashed the attempt, the imperial ambitions for profit, knowledge making and control over nature congealed in the experimentation was carried on and remolded into a nationwide project of socialist science in the People's Republic of China—the Acclimation of Kelps to South China (haidai nanyi). This paper traces the history of the nationwide project, which intends to transplant the cold-loving plant towards the nation's southernmost province in Guangdong, in order to increasing the kelp's output as grain-substitute food and raw materials for the industrial production of iodine, mannitol, and alginic acid. Focusing on the experiments at Chinese Academy of Sciences' Institute of Oceanology and state-owned provincial fisheries in Shandong, this paper first examines the making of ecological knowledge and practices that transformed the waters offshore into a place farmable for seedless kelps' breeding, fertilization and development.

It further traces the technological process which intends to maximizing the output of kelps for socialist China's self-sufficiency in food, drugs, and clothes, but eventually led to its overproduction. It concludes by offering a new perspective to tackle the issue of aquatic productivity as it is approached by a terrestrial-centered regime of politics and science.

Scientists' Imperial Aftermath: Coral Research in Early Decolonized Japan ***Lisa Yoshikawa, Hobart and William Smith Colleges***

In the interwar years, Imperial Japan became one of the aspiring leaders in Pacific biological coral research alongside the U.S., Australia, and the Netherlands. The post-World War I incorporation of Micronesian mandate and the booming industrial economy only slightly stalled by the Great Depression catapulted Imperial Japan by the mid-1930s to become the sole hegemon boasting a tropical coral research station, in Palau. Having access to another, more permanent base in coral-rich colonial Taiwan, with the 1928 establishment of an Imperial University, gave opportunities to scientists like Kawaguti Sirō to become a world coral authority. The early 1940s occupation of Southeast Asia came as a bonus to this upswing. Imperial Japan's defeat in the Asia Pacific Wars came with dire research consequences for these scientists. Most of its known subtropical and tropical coral habitat territories were re-occupied by former imperialists or granted independence, with the Ogasawara, Ryūkyū, and Micronesian islands newly occupied by the U.S. and Taiwan by the Republicans. Japanese scientists based in those regions and who survived the war were repatriated, often taking up university positions in the metropole. In the very immediate postwar years, they were also politically shunned from international academia, most famously barred from the first postwar May 1949 Pacific Science Congress held in New Zealand. This paper examines Japanese coral scientists such as Kawaguti and how they adapted to this sudden loss of access to research sites in the context of this otherwise welcome early stage of the demise of modern empires.

Session Organizer:

Lisa Yoshikawa, Hobart and William Smith Colleges

Chair:

Fa-ti Fan, Binghamton University

095. Twentieth-Century Histories of Sex and Reproduction

Contributed Paper Session

8:00 to 9:30 am, Saturday 9 Nov.

Holiday Inn: Lobby Level - San Jacinto

Participants:

Abortion and Emotions in Ireland, 1900-1950

Cara Delay, College of Charleston

In this paper I examine women's embodied experiences and emotions during illegal abortion cases on Irish soil in the twentieth century. Through an interrogation of courtroom narratives and other sources such as coroners' reports, this paper analyses the language that women used to describe fertility control. It asks how women constructed their narratives, revealing that, unlike judges and physicians, they did not view their abortion experiences through the lens of modern legal or medical discourses. Neither did they reference religion or morality. Instead, they placed their experiences in the ordinary, in familiar contexts, including traditions of domestic health care and community connections. Women's pain narratives, I argue – how women experienced, processed, and articulated suffering and pain—also related directly to their circumstances, and in particular to the relationships they had with abortionists. This research demonstrates that expressions of pain and suffering provide insight into not just the individual but the community as well. For example, descriptions of abortion pain reveal how women responded to each other, talked to each other, or supported each other during abortion attempts. Through recognising and attempting to manage each other's pain, they created community. Meanwhile, the complex reactions of authorities, including policemen and doctors, to women's articulated pain and suffering reveals 'official' attitudes toward the costs of women's 'deviant' sexual practices alongside a very real sympathy for the plight of women facing unwanted pregnancies in difficult circumstances. In recent years Ireland has faced widespread criticism of its treatment of pregnant women, mothers, and infants. Little is known, however, about Irish women's actual embodied experiences of reproduction in the past, and particularly overlooked is an analysis of how women felt, thought about, managed, and communicated about reproductive fear, suffering, and pain. This paper hopes to spark such conversations in a historical context.

Scientific Motherhood: Public Health, Gender,

and the State in Brazil, 1930-1945 ***Melissa Gormley, University of Wisconsin-Platteville***

Brazil in the 1930s and 1940s underwent dramatic political and socio-cultural changes that included re-defining women's roles within the state and society. The Vargas administration sought, at times successfully, to unify society under a singular homogeneous national identity, address perceived fears of decreasing population rates, and advocate for scientific motherhood. Within the context of various public health initiatives, women's roles were crafted as traditional, family oriented, and as acts of self-sacrifice for family and nation. Under the paradigm of scientific motherhood, the state and medical community created a space to intervene in the name of modernity. This research will examine the Brazilian state's narrative that attempted to move away from earlier racialized, eugenic discourse and instead focus on socio-economic status as a proxy to further include women in the modernization project. Vargas used the language of poverty to call attention to the problematic role of mothers and replaced racialized language with labels such as "ignorant/uneducated," "impoverished," "uncultured," and "diseased." This research will argue that while these categories were fluid and women could move out of them, they required state intervention through public health programs and initiatives, thus creating the paradox: women were essential to the state as mothers, reproducers of Brazilian society, but only under the terms dictated by the state.

Your Sex Questions Answered: the Rich Text of Sexology Magazine's Letters Section ***Matthew Lavine, Mississippi State University***

Over the course of its fifty-year run between 1933 and 1983, the middlebrow American pulp magazine Sexology (and its Spanish-language counterpart, Sexología) responded to more than 6,000 reader inquiries in its monthly Q&A section. The physician-editors who answered the letters in the mid-century, D.O. Cauldwell, Frank Caprio, and LeMon Clark, were prominent sex educators in their own right, and the sober and clinical tone of their responses stood in contrast to the more whimsical or dubiously credentialed articles that made up the remainder of each issue. These letters constitute a rich corpus of sexual advice literature from the period, and one that has not yet received systematic study. In particular, they capture far more of the actual dialogic nature of adult sexual education than marriage manuals or public health literature can. While physician-authored adult sexual education books of the post-Kinsey era tended to present sexual health as a goal attainable through specific physical and social regimens, the content of Sexology's reader submissions hew much more closely to the complicated reality described in physician memoirs. Exquisitely sensitive to reader interests because of the low-margin nature of the publishing industry—and always on the lookout for free content—Sexology published reader letters that revealed in their candor not so much a lack of sexual knowledge, but entirely different paradigms of it. This paper will use both broad qualitative trends in these published letters and specific case studies to read against the traditional narrative of the medicalization of sexual wellness in this period.

Reproductive Justice in a Global Context. Historicizing and Comparing Abortion Rights in Mexico and Germany ***Elizabeth O'Brien, University of California, Los Angeles; Jethro Hernandez Berrones, Southwestern University; Birgit Kolboske, Max Planck Institute for the History of Science***

In the context of reproductive freedom, the image of a wire coat hanger holds an immensely brutal power: it is the icon of women's deprivation of legal, safe, and unrestricted access to abortion. Considered a cultural artifact in many Northern communities, recent shocking backlashes—such as the US Supreme Court overturning Roe vs. Wade—contradict this notion. At the same time, however, the Green Wave (marea verde) attained some watershed victories in Latin America, which has some of the most draconian anti-abortion laws in the world. Historians of science and gender have described how, time and again, women's bodies have been transformed into political battlefields by powerful state actors. Similarly, historical trajectories of abortion show that reproductive biases are aligned along the axes of class, race, ethnicity, and gender so that the reproduction of certain groups is valued while that of others is degraded. Abortion encapsulates issues regarding the role of women in society and the influence of religious stakeholders in public and political life. Thus, reproductive freedom needs to be positioned as a fundamental component of gender citizenship in (secular) democracies, with

diversity being duly acknowledged. My talk focuses on reproductive justice, women's and gender history, and the ways in which feminist movements have both put up resistance and achieved victories in traditionally conservative countries. Weaving a web of questions spanning politics, ethics, and public health, it will broach the issue of how the Mexican Supreme Court issued a ruling decriminalizing abortion nationwide—despite being labeled as country »emblematic of women's suffering« due to its shocking number of unsolved femicides. Furthermore, it will explore why such progressive legislation remains a distant dream in Germany in the twenty-first century.

Chair:

Carlo Sariego, Yale University

096. Life at the Limits of Liberal Anti-Racism

Organized Session

8:00 to 9:30 am, Saturday 9 Nov.

Holiday Inn: Lobby Level - Santiago

This panel brings histories of the life sciences in the U.S. and Europe into conversation with histories of liberal antiracism. Historians have documented how the life sciences aligned themselves with internationalism, universalism, and antiracism in the wake of the Second World War. Recent scholarship has contended that this twentieth-century reinvention nevertheless retained similarities with colonial, imperial, and ethnonationalist epistemes. This panel departs from the convention that interprets such reinvention as a failure to achieve the promises of liberalism. Instead, it explores a longer history of the political limits of liberal antiracism. Myrna Perez Sheldon re-examines eighteenth-century natural history through the lens of postcolonial theory to illuminate the limits of liberal citizenship for multiracial belonging in the United States. Nayanika Ghosh investigates the conflict between Science for the People and the Committee Against Racism during the sociobiology debate in the postwar U.S., and situates Science for the People in a genealogy of liberal, rather than radical, antiracism. Cameron Brinitzer critically analyzes how twenty-first century experimental sciences of culture leverage liberalism to distance themselves from the racial politics of their epistemic predecessors. Together, the panel poses a provocation: liberal antiracism is not a failed or insufficiently fulfilled project, but an impossible one.

Participants:

From Creole to Caucasian *Myrna Perez Sheldon, Ohio University*

Why was the United States not regarded as a nation of mixed-raced individuals at its founding? In this paper, I argue that the transition from the category of "creole" to the designation of "caucasian" was essential to the material and philosophical structure of liberal citizenship at the founding of the United States. The U.S. founding national discourses relied upon an assertion of natural and inalienable rights. This assertion rejected the logic of creole identity— a category drawn from early modern Christian colonial administrative frameworks that organized its understanding of human variation and character within the humoral frameworks of Galenic medicine. In this, the term creole (or crioulo or criollo in the Iberian imperial contexts) designated an individual born to European parents in the Americas. Thus, creole made a material and social distinction between individuals based on geographic location and environmental causation. To assert the natural right to rule in the American Revolution, writers, philosophers, and naturalists rejected environmental causation in favor of the modern discourse of race— asserting America as a nation of caucasian people. In this paper, I briefly trace this transition in the writings of Thomas Jefferson and Samuel George Morton to consider how the United States successfully asserted itself as a caucasian, rather than a mestiza nation. I will also comment on the need to consider these enlightenment transformations in a postcolonial theory of secular liberalism that takes the founding of the United States as a pivotal moment in a new global discourse of whiteness.

Was Sociobiology Race Science? Sociobiology Study Group v. Committee against Racism in the Postwar United States *Nayanika Ghosh, Harvard University*

In 1975, in response to the publication of EO Wilson's Sociobiology, a group of scholars belonging to the Boston Chapter of Science for the People formed the Sociobiology Study Group (SSG). Scholars distinguish Science for the People (SftP), that grew out of the late 1960s antiwar movement in the United States, from advocates of liberal scientific reform. Likewise, historians of sociobiology have documented the SSG, whose members belonged to SftP, as a Marxist group that furnished a radical antiracist critique of sociobiology and postwar biological determinism. However, archival evidence of internal conflict within the SSG over the "disruptive" tactics of an organization called the Committee Against Racism (CAR) suggests that SftP and SSG did not wish to associate

themselves with a communist organization such as the CAR. Moreover, the CAR accused the SSG of failing to adequately critique or respond to the racism of sociobiological theories. Finally, evidence from oral histories suggests that many others considered the SSG to be distinctly unradical. In this talk, I will attend to these three strands of evidence to explore if the SSG, despite being red-baited, departed from radicalism to uphold a liberal critique of science. Ultimately, I argue that the conflict between SSG and CAR illuminates the limits of liberal antiracism in the postwar United States.

Epistemic Balance in a Liberal Life Science of Culture ***Cameron Brinitzer, Max Planck Institute for the History of Science***

In 2015 the Cultural Evolution Society was established by a group of life and mind scientists to institutionally centralize their common project of reconceptualizing the human sciences from an evolutionary perspective. The overarching aim of the new society was to theoretically account for human culture with the tools of evolutionary genetics and cognitive psychology. In their programmatic texts and public-facing scholarship, cultural evolutionists narrated their research as filling an epistemic gap that was created when cultural anthropologists betrayed positivist science in the 1970s and 1980s. Positioning themselves as heirs to biology's modern synthesis and psychology's cognitive revolution, cultural evolutionists argued that an experimental life science of culture was needed to correct the epistemic extremes of postmodern and postcolonial anthropologists on the one hand, and outright genetic determinists on the other. In this presentation, I examine cultural evolutionists' claims to a sober scientific middle-ground as a political strategy for advancing liberal universalism while evading a confrontation with the racial politics of culture and the concept's freighted histories.

Session Organizers:
Nayanika Ghosh, Harvard University
Cameron Brinitzer, Max Planck Institute for the History of Science

Chair:
Sebastián Gil-Riaño, University of Pennsylvania

097. Registration Day 3

8:00 to 5:00 pm, Saturday 9 Nov.
Fiesta Americana: Yucatan Foyer Registration Desk

098. Beyond the R1: Roles for Historians of Science Within and Beyond the Academy (GECC Professionalization Event)

Roundtable
8:00 to 9:30 am, Saturday 9 Nov.
Fiesta Americana: Lobby Level - Yucatan I

Graduate training in the history of science prepares students for "typical" tenure-track careers consisting of research and teaching. However, the combination of a constrained job market for tenure-track historians and the diversity of grad students' career interests mean that many if not most PhDs in the history of science have non-typical careers. What kind of opportunities are a good match for our research, teaching, and transferable skills? How can grad students and early career scholars be prepared to apply for alternative academic and "alt-ac" roles? In this interactive workshop, participants will hear from a panel of speakers, experienced in a variety of careers within and beyond the academy, about how to be prepared and intentional on the job market. Participants will be able to share their goals and experiences in mentored small groups and receive advice and specific feedback to develop and refine their search. The session will end with a facilitated discussion/Q&A period. Panel moderator: Ellie Louson, Michigan State University (Educational Developer, Center for Teaching & Learning Innovation; Assistant Teaching Professor, Lyman Briggs College)

Session Organizers:
Zi Yun Huang, University of Chicago
Mary Kate Wolken, University of Minnesota

Chair:
Ellie Louson, Michigan State University

099. Disasters, Natural and Unnatural

Contributed Paper Session
8:00 to 9:30 am, Saturday 9 Nov.
Fiesta Americana: Lobby Level - Yucatan II

Participants:

Disaster and Improvement in Seventeenth-Century Jamaica ***Hannah Kaemmer, Harvard University***

In 1692, an earthquake struck Port Royal, Jamaica, leveling its infrastructure and causing most of the busy port town to sink below sea level. Eleven years later, in 1703, the English military engineer Christian Lilly produced a map of the harbor featuring Port Royal (now an island) as well as the town of Kingston on the harbor's northern side, over which was laid a planned urban grid. This paper uses Lilly's map, and this projective street grid, to consider

the relationship between climatic disasters and improvement in the context of England's seventeenth-century empire. A growing scholarship in the history of science has examined the many schemes to "improve" threatening natural landscapes in early modern Europe. Less attention has been paid to similar projects undertaken in colonial settings, where these figures worked in unfamiliar climates and geographies and documented their efforts in text and images for audiences in Europe. This paper considers how knowledge about the 1692 earthquake was produced in the years immediately following the disaster—in sources ranging from Lilly's maps to Hans Sloane's reflections in the Royal Society's Philosophical Transactions—and traces how that knowledge was at once integrated and overlooked in the design of a new urban environment at Kingston, keeping in mind the inflexible rigidity of its street grid. Ultimately, I aim to draw out the complex negotiations among military engineers and surveyors, natural philosophers, colonial administrators, landowners, and enslaved Africans as they navigated the uncertain terrain of (re)constructing urban space in an unstable environment.

Anatomy of an Oil Well Fire Crafting Explanations about a Disaster in Veracruz, Mexico, 1908 ***Martha Lucía Granados-Riveros, Universidad Nacional Autónoma de México; Ana Barahona, Universidad Nacional Autonoma de Mexico***

In this work, I discuss Pearson & Son Ltd.'s management of an oil well fire north of Veracruz, Mexico, in mid-1908. At its peak, the plume of burning oil reached 650 feet and lasted almost two months. The conflagration shook the company's day-to-day operations and brought the Gulf of Mexico to the attention of international oil producers. Through the paperwork produced by the company during the emergency, I explored how the company's managers provided explanations of the incident. Through the logs, studies, and correspondence, the company's managers crafted various accounts and explanations of the incident. Each narrative of the facts differed, moving away from a unified version of events. The diversity of versions is a testament to the complexity of the incident. I, therefore, delve into the factors that may have influenced these diverse accounts, such as post-fire studies, the company's national political context, or the intended audience of the reports, be it internal, for public opinion, or the oil industry. The 1908 fire disrupts the narratives of oil industrialization that predominantly focus on the global north. It compels oilmen to question the causes of a gusher of unprecedented dimensions in the Americas or why tropical wetlands challenged sophisticated machinery that functions optimally elsewhere. This case study may enrich our understanding of the contingent and historical interplay between science and capitalism.

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.

Revisiting the Cause and Meaning of the Castle Bravo Fallout Disaster ***Alex Wellerstein, Stevens Institute of Technology***

The 1954 Castle Bravo detonation was the worst radiological accident of the United States

nuclear testing program, contaminating tens of thousands of square miles of the territory of the Marshall Islands, including several inhabited atolls, and exposing nearby Marshallese, American observers, and the crew of a Japanese fishing boat to harmful levels of radioactive fallout. Despite being a fixture of both popular and scholarly interest for the past 70 years, the underlying cause of the accident has only very recently been understood. The official explanations -- that a change in wind conditions, coupled with an unexpectedly high-yield -- are now known to have been incorrect and deliberately misleading. Documents and reports declassified and released in the last decade or so in fact point to an entirely different source of the error: a fundamentally flawed and unsubstantiated theory of stratospheric fallout for megaton-range weapons. This theory had no empirical support prior to Bravo, and could have been experimentally disproven years prior to the test. In my talk, I will discuss the actual cause(s) of the Bravo accident: the bad theory itself, and the practices of Cold War knowledge production that created and sustained it to the point of disaster, and the reasons why this has stayed unknown for so long a period. I will then explore how this new understanding dramatically changes the historical (and possibly legal) narratives around this event.

Chair:

Matthew Stanley, New York University

100. Is there an 'Ethical Turn' Occurring in the History of Science, Medicine, and Technology?

"Futures" Roundtables

8:00 to 9:30 am, Saturday 9 Nov.

Fiesta Americana: Lobby Level - Yucatan III

Every historian desires (or at least protests) that they are personally ethical and agree that there no one should engage in unethical forms of scholarly conduct. However, to many, the imposition of an ethical position on the study of the past feels simply wrong as a methodological fact. Despite this sentiment, multiple areas of inquiry in history at present, however, seem newly invigorated by questions of ethics. Frameworks as wide-ranging as disability studies, child studies, and Indigenous studies, have generated renewed interest in ethical considerations. Doubtlessly one force pushing these questions arises from new moral frameworks proposed by anti-racism and postcolonial and decolonial theory, Indigenous studies, and environmental justice movements, as well as renewed contestations in the United States over human reproductive autonomy. Exploring the possibilities of an 'ethical turn' in the historiography of science and medicine, this roundtable proposes to offer a wide-ranging discussion of these matters. We will invite a conversation among panelists and the audience addressing key questions: 1) Are historians and STS scholars suddenly interested in ethics and, if so, why? 2) How are historians expanding the scope and depth of histories of science and medicine through collaborative and ethical work? 3) Do ethical insights from other core literatures, as, for instance, Bioethics and Medical Ethics, Indigenous Studies, Disability Studies, and Latin American and Caribbean Studies, offer useful ethical frameworks for historians? And, finally, 4) are ethical frames necessarily antithetical to the historian's work?

Chair:

Ayah Nuriddin

Participants:

Julia E. Rodriguez, University of New Hampshire
Courtney Thompson
Jonathan Sadowsky, Case Western Reserve University
Adam Warren, University of Washington
Stephen T. Casper, Clarkson University

101. Echoes of the International Geophysical Year in the Americas: Bridging Science and Diplomacy

Organized Session

8:00 to 9:30 am, Saturday 9 Nov.

Fiesta Americana: Lobby Level - Yucatan IV

The International Geophysical Year (IGY), spanning from 1957 to 1958, was a global scientific effort to study various aspects of the Earth. Building upon the foundation laid by previous Polar Years, the IGY drew participation from nearly 70 countries collaborating on eleven strategic areas. Set against the backdrop of the Cold War era, this significant scientific event worked with a diverse and expansive international community, challenging and asymmetric. Based on the principle of international cooperation and aimed at using science to foster diplomatic relations, the IGY set a historical precedent in studying the planet as a global and systemic environment which, at the same time, connected itself with previous scientific relations. Historiography has extensively examined the dynamics and legacies of the IGY in the polar regions and the North-Atlantic world. However, the time seems ripe for new perspectives that highlight how this endeavor was reshaped by the political, social, and cultural dynamics that took place within the Americas, challenging traditional north-south interactions. By presenting case studies from Chile, Argentina, Mexico, and the USA, this panel aims to enhance not only our understanding of the IGY's enduring legacy in the region, but also the imprint of the Americas in the development of Geophysics and the contributions of

non-northern countries to this pivotal international scientific event. We aim to foster a discussion on the understanding of science diplomacy and international relations in science by bringing together experiences from both northern and southern regions in the America.

Participants:

'Most Serious Implications for the Future Health and Welfare of the Human Race': Secret Kennedy Administration Debates over Large-Scale Environmental Experiments ***Ronald Doel, Florida State University***

In October 1962 members of the U.S. National Security Council sought advice from leading scientists about what Kennedy Science Advisor Jerome Wiesner termed "the problem of large-scale experimentation with possible environmental effects." Those reading his classified report–addressing not just radioactivity released from nuclear tests but also deliberate weather modification, reflective needles placed in low orbits to aid military communications, and massive fish kills in the Colorado River–reacted with alarm. Lloyd V. Berkner, a key architect of the 1957-58 International Geophysical Year, replied, "[t]he problem of experiments modifying the whole environment is real", and new policies were needed to avoid "real damage to science [and] real damage to the human environment." Robert S. Morison, the influential director of natural sciences programs at the Rockefeller Foundation, was blunter still. "The unilateral exercise of the power to alter our common environment raises moral and ethical questions of the greatest gravity," he asserted. "In some as not yet very well-defined sense," he added, "it is beginning to be recognized that individuals and societies have 'rights' to what might be called the historical ecology of the region they inhabit." Why does this story matter? Until key documents were recently released, historians had little sense the Kennedy White House was concerned with global environmental issues beyond radioactive fallout: better-known are Kennedy-era policies limiting pesticides, combating pollution, and aiding conservation. But a still larger issue is the way that grappling with large-scale environmental experiments in the IGY's wake accelerated thinking about natural resources and encouraged Western political and scientific leaders to conceive Earth's bio-geosphere as a cohesive whole. This presentation, based on new archival work, links history of science with science diplomacy, environmental history, and historical geography

Exploring Science Diplomacy. The IGY, Southern Hemisphere Engagement and the Case of Chile ***Barbara Kirsi Silva, Universidad Catolica de Chile***

In 1957, UNESCO presented the IGY as "History's greatest science research project" in its publication, Courier. This accolade referred both to its coverage of eleven scientific 'strategic' areas, and the participation of nearly 70 countries worldwide, including Chile. In the southern corner of Latin America, the Chilean government formed a special commission, known as the Executive Commission for the IGY (CEAGI, by its name in Spanish), led by a Chilean Army General. By 1957, CEAGI had reported progress in all the scientific areas, with collaboration from various countries, notably the United States. Interestingly, the US was not the sole international collaborator as some Latin American initiatives were also incorporated. At the same time, progress was made on numerous regional stations, in a country characterized by limited national infrastructure and a deep tradition of centralism. The IGY efforts also involved a combination of military involvement with the emerging scientific progress in two universities in the country, bringing together disparate actors in the scientific landscape. This paper aims to explore the multifaceted development of scientific work occurring simultaneously within the framework of IGY. In doing so, it serves an opportunity to analyze how southern countries engaged in the practices of scientific diplomacy and the implications thereof for scientific advancement in the southern hemisphere, as well as its impact on northern scientific endeavors

Negotiating the "Geo-" of Cold War Geopolitics: Mexican Seismological Practices during the International Geophysical Year ***Gloria Maritza Gómez Revuelta, El Colegio de México/Universidad de Guadalajara***

The International Geophysical Year (1957-58) –in which 67 countries across 14 disciplines collaborated to study the Earth– is a moment in the Cold War that warrants analysis from an Inter-American Cold War perspective. During the 18 months of the project, geophysical researchers negotiated science's demand for universal knowledge within a world structured by the Cold War's geopolitical alliances. Mexico, with its long seismologic tradition and non-interventionist foreign policy, offers a

unique vantage point from which to examine this moment in the history of earth sciences. Examining how Mexican seismologists and their international counterparts collaborated, planned research, and shared data, this paper asks how Cold War geopolitical tensions informed scientific practice during the IGY, and how scientific practices, in turn, offered new language for geopolitics. As scientists organized, for instance, to manage who had access to hemispheric data, science emerged as both symptomatic of US ambitions of hegemony over the Americas and a tool for negotiating this hegemony. However, modern seismology warranted connections between specialists and circulations of instruments and data that defied Inter-American dynamics and bridged Cold War divides. Drawing on documents produced by the Comité Spécial of the IGY, the Pan-American Committee for the IGY, and the Mexican Committee for the IGY, this article argues that geophysics' demands for theoretical and methodological standardization in the earth sciences was a vector through which a multipolar and Inter-American Cold War could be diplomatically navigated

Southern Perspectives on Continental Drift: The Reunion of Fragments of the Earth History by Joaquin Frenguelli ***Mariana Ferrari Waligora, Universidad Nacional de La Plata, Argentina***

The focus of this paper is on the analysis of the intellectual practices of the Italian-Argentine Joaquin Frenguelli, director of the Museum of La Plata (between the 1930-1950s). This research is part of the broader scope of the history of knowledge connected from the southern hemisphere, more specifically on the acceptance of continental drift and the studies on one of its main pieces of evidence, the Glossopteris flora. The drift theory was more widely accepted in the southern hemisphere and mobilized a network of south-south scientific exchanges and collaborating with a discourse of exaltation of national science. The South American fossils of the Carboniferous/Permian Glossopteris Flora were present specially in Brazil and Argentine. The material analyzed shows that Frenguelli was able to consult the most important publications on the theme produced in Europe and North America in different languages, as well as communicate with his pairs in the southern hemisphere. He studied these topics in detail, producing notes that would help him in his own production of articles, as well as in his classes. The gathering of evidence for continental drift becomes a cause that gives identity to southern hemisphere scientists and, in some way, consolidates the geography of the ancient southern continent Gondwana. This concept and the continental drift theory were part of the global endeavor for understanding and measuring Earth phenomena and opened the way for the development of the theory of plate tectonics and the increasing centrality of geophysical studies, culminating in the IGY. At this time, the science being produced in the south was more clearly expressive. On the other hand, this paper contributes on showing the intense involvement of the scientific production of the southern hemisphere in earlier times and the impact of more specifically South American science and the south-south interactions on the Earth sciences.

Session Organizers:

Barbara Kirsi Silva, Universidad Catolica de Chile
Gloria Maritza Gómez Revuelta, El Colegio de México/Universidad de Guadalajara

Chair:

Adriana Minor, Centro de Estudios Históricos, El Colegio de México

102. GECC Welcome Room Day 3

9:00 to 5:00 pm, Saturday 9 Nov.
Fiesta Americana: Lobby Level - Santa Lucia

103. Exhibit Hall Day 2

9:00 to 5:00 pm, Saturday 9 Nov.
Fiesta Americana: Yucatan Foyer

104. Multidisciplinary Approaches to the History of Chemistry. Panel 2: Life Sciences, Economy and Sociopolitical Perspectives to the History of Chemistry

Organized Session
10:00 to 11:30 am, Saturday 9 Nov.
Fiesta Americana: 1st Floor - Izamal I

This panel is part of a three-panel session on Multidisciplinary approaches to the history of chemistry. A central task for the history of chemistry is to understand the processes that have promoted an exponential expansion of chemical knowledge over the past two centuries, while creating a discipline that exhibits a vast, multifaceted range of interactions with its social context. Lying at the border of academic science and industrial technology, chemistry produces both major benefits and risks for society and has dramatically shaped the disposition of the world's resources. The analysis of the processes that have created modern chemistry is now nuanced by the increasing amount of historical data and computational power, which provide an opportunity for multidisciplinary approaches to the history of

chemistry. In fact, new insights on the history of chemistry and new methods and tools for its practice are emerging from scientists and scholars from mathematics, computer sciences, physics and linguistics, among other disciplines. These multidisciplinary approaches do not come alone, but are enriched by the epistemic frameworks of each contributing discipline, which nuance those of the history of science. The aim of the proposed session is to bring historians and practitioners of these multidisciplinary approaches to the history of chemistry together to contrast their results and methods, and to promote a multidisciplinary dialogue for the sake of the history of chemistry. We believe that through this discussion, researchers and scholars can gain a more holistic understanding of complex historical phenomena and can also avoid oversimplifications or biases inherent in single-discipline approaches. We are, in particular, interested in addressing the following questions: What specific questions can be resolved by the multidisciplinary approaches to the history of chemistry and which cannot? What is the role of formal models in historiographical narratives? What is the appropriate coarse-graining level for the history of chemistry, and to what extent can this level be addressed by different disciplines? Can multidisciplinary approaches help link macrohistory with microhistory? What formal models are most suitable for historiographical research? What are the disciplinary challenges posed by the history of chemistry? This session houses contributions from researchers across various disciplines in the history of science, as well as in chemistry, computer science, life sciences, linguistics, mathematics, philosophy and physics. By fostering collaboration among diverse fields, we aim to gain comprehensive insights into the multifaceted nature of the historical unfolding of chemistry. Moreover, our panellists align very well the diversity HSS guidelines in terms of “gender, career stage/track, geographical location, and institutional affiliation.” This session is co-sponsored by the HSS Forum on History of Chemistry, the Commission on the History of Chemistry and the Molecular Sciences and the Society for the History of Alchemy and Chemistry. The organisers and panellists will engage in an overall discussion during the final time slot of this panel to deliberate on the session's topic in its entirety and will tackle the central questions running across the whole session.

Participants:

Recent Historical Unfolding of the Chemistry of Rare-Earths ***Marisol Bermudez Montaña, Tecnológico de Monterrey***

In the 2010s, rare earths gained significant attention in the global media due to the political tensions arising from China's announcement of a potential halt in its exports of these 17 chemical elements. This political maneuver underscored the widespread dependence of contemporary technology and economic progress on this relatively small segment of the chemical space located at the fringes of the periodic table. In this discussion, we present findings concerning the research-level implications of the so-called rare-earth crisis. By examining the annual production of new rare-earth chemicals from 1981 to 2020, we identified the predominant role played by the USA, China, and a handful of other nations in rare-earth research before 2003. Subsequently, there was a marked surge in China's influence, firmly establishing the Asian country not only as a commercial leader in rare earths but also as a key player in research. Our analysis also revealed that China's post-2003 ascendancy is primarily attributed to internal Chinese research efforts. In contrast, the scientific contributions of the USA, the second-largest producer of rare-earth knowledge, heavily rely on collaboration with Chinese counterparts. Intriguingly, despite the well-known magnetic properties of several rare earths, the expansion of the chemical space associated with these elements has predominantly stemmed from the growth of organometallic chemistry rather than advancements in alloy development.

Serodiagnostics and the Dispossessed ***Casey Olthaus, Miami University***

This paper argues for an interdisciplinary examination of the imperfect origins and subsequent appearance of the Wassermann serological test, the first blood test for detecting syphilis, in eugenics initiatives and medicolegal mandates. The test is an example of serology’s imperfect past and the importance of combining micro and macro histories to better understand the human cost behind advancements in serology and the origins behind modern day allocations of STI testing initiatives. When this seemingly impartial and passive medical tool intersected with preexisting social and cultural biases regarding syphilis its story becomes one of blood purity initiatives for the preservation and proliferation of White normativity. Reframing the Wassermann test as more than a passive medical tool highlights how ostensibly impartial medical processes can produce institutional violence at the intersection of race, gender, and sexuality. The Wassermann test, originally a beacon of hope in the fight against syphilis, took a troubling turn

when it was misused as a tool to justify racial discrimination in the 20th century. Initially developed in 1906 in Berlin, it was used to diagnose syphilis but was later co-opted to support racially biased views. This misuse is traced from its inception, where biomatter from marginalized groups was used, to its incorporation into eugenics-based laws in the US. By examining scientific literature, legal records, and public health initiatives, this study aims to highlight how the Wassermann test, though flawed, was wielded to perpetuate societal biases based on gender and race, with ramifications still felt today.

PFAS and Endocrine-Disrupting Chemicals—Why a Multidisciplinary Approach Is Imperative for the History of Chemistry
Marsha L Richmond, Wayne State University Detroit

In April, newspapers announced that for the first time, the US EPA has set a limit on the amount of `Forever Chemicals' present in the nation's drinking water. PFAS—a huge family of chemicals containing per- and polyfluoroalkyl chains—have since the 1950s been used in a vast array of everyday products, most notably, 3M's blockbuster waterproofing product Scotchgard™ and DuPont's lucrative Teflon, soon to be phased out. These chemicals are but two of the most infamous synthetic chemicals (now numbering in the hundreds of thousands) within the purview of environmental and public health officials. In the early 1990s, scientists learned that industrial chemicals, most notably pesticides, PCBs, and dioxin, could cause reproductive and developmental problems in embryos, often evidenced only in adulthood. The new field of endocrine disruption explained this by noting that such chemicals derail normal development because of their close resemblance to estrogen, androgen, and other hormones used by the endocrine system, mimicking or blocking their action, and hence interfering with normal development. Regulating PFAS is hence but a small if significant victory. My paper will argue that to incorporate the rise of postwar industrial chemicals into the history of chemistry requires a multidisciplinary approach that engages such fields as toxicology, ecotoxicology, embryology, endocrinology, epidemiology, environmental and public health, not to mention chemical engineering, business history, and capitalist economics. The critical societal threats industrial chemicals pose may well alter chemistry itself, to respond to the need to design chemicals that minimize hazards posed by chemical toxicants.

Session Organizers:
Guillermo Restrepo
Jeffrey Allan Johnson, Villanova University
Brigitte Van Tiggelen, Science History Institute

Chair:
Guillermo Restrepo

Commentator:
Guillermo Restrepo

105. Exemplarity in the History of Science

Organized Session
10:00 to 11:30 am, Saturday 9 Nov.
Fiesta Americana: 1st Floor - Izamal II

"Unhappy the land that is in need of heroes! (Unglücklich das Land, das Helden nötig hat.)" Galileo Galilei declares at the end of Bertolt Brecht's eponymous play on the astronomer's life. The history of science has long been an unhappy land. At the end of the Structure of Scientific Revolutions, Thomas Kuhn identified two "concrete achievements" of his book: the notion of paradigms and the use of exemplars in understanding scientific problems. For Kuhn, exemplars are the key to shared perception in a scientific community. Within the history of science, exemplary individuals have played a similar role. Building on work on biography, masculinity and scientific personas in the history of science (Isis 2006; Osiris 2015), this panel shows how exemplary figures have continued to stand in for civilizations, periods, and the principles of scientific inquiry - and how they might be challenged. This panel pursues exemplary scientific persona across a range of regional historiographies. Eric Moses Gurevitch presents on an early modern challenge to the authority of Vāgbhaṭa, who in was - and continues to be - taken as the representative of medicine in India. Elly Truitt examines how the polymath Roger Bacon was characterized as a visionary in an otherwise intellectually stagnant age. This anachronism of "a modern mind in an unmodern age" makes possible a narrative that promotes and upholds Christian Europe as the origin point for scientific thought. Shireen Hamza revisits modern narratives of Bīrūnī's exemplarity by excavating the medieval reception of his medical work at the Delhi Sultanate in India, asking why Bīrūnī is remembered today while other authors are forgotten. Nir Shafir shows how, before Katib Çelebi became the exemplar of Ottoman genius for his translations of Latin geographies, he was famous for clerks' work, acts of compilation and tabulation, rather than the logic-centered theorizing of madrasa-based scholars.

Participants:

The Exception Proves the Rule: Roger Bacon,

the Middle Ages, and Narrative of Scientific Progress ***Elly Truitt, University of Pennsylvania***

Deemed “the stationary period” and the “noonday slumber” in the development of science by William Whewell in the early nineteenth century, the historical period called “the Middle Ages” has been characterized as credulous, erratic, and intellectually stagnant—a thousand-year pause in the development of scientific knowledge. Paradoxically, the thirteenth-century Scholastic natural philosopher and Franciscan polymath Roger Bacon has largely been characterized in the historiography of science as a visionary, intellectually precocious, and anachronistic: a modern mind in an unmodern age. This paper argues that this paradox is at the heart of the traditional established narrative of the history of science, because it makes possible a narrative that promotes and upholds Christian Europe as the origin point for scientific thought. If a medieval Christian, trained in Aristotelian logic, could articulate the importance of instrumentation and experiment to understanding nature, then he could be understood and explained by later historians in terms of modernity, and as evidence of a naturalized, apparently inherent capability for scientific thinking. The case studies of Roger Bacon and the Middle Ages demonstrate the importance of exemplarity in the historiography of science and the opportunities and restrictions that exemplarity provides.

Beyond Biruni: Narrating Islam and Science in Medieval South Asia ***Shireen Hamza, Northwestern University***

Abū Rayḥān Bīrūnī, a tenth-century polymath from Khwarazm (now Uzbekistan), has become the paragon of Islam and science in South Asia. Hospitals, schools, and laboratories are named after him across the subcontinent. The pharmacopeia he wrote after visiting India with Mahmud of Ghazni has been translated into English by modern practitioners of Unani medicine. Pakistan is building a Biruni science center in the rural mountain region where he measured the circumference of the earth. I interrogate modern narratives of Biruni’s exemplarity by excavating the medieval reception of his medical work at the Delhi Sultanate in India. There, a scholar produced a full translation of his Pharmacopeia (Kitāb al-Ṣaydana) from Arabic into Persian. By studying this translation alongside three other Persian texts of medicine written at the court of the Delhi Sultanate, I ask why Biruni’s Pharmacopeia - and Biruni himself - is remembered today while these other authors and their texts are forgotten.

Clerk’s Work: The Banal Origins of Katib Celebi’s Genius ***Nir Shafir***

Katib Çelebi (1609-1657) may be the only early modern Ottoman, not to mention Islamic, scholar known to the broader world. Today, universities are named after him, and symposia are regularly held on his life and work in Turkey. He has become the exemplar of Ottoman genius, both popularly and academically. He is primarily lauded for his translations of Latin geographies and copious bibliographic projects, which give modern readers the sense that the Ottoman world was on the cusp of embracing the modern science of Europe. In his own time, however, Katib Çelebi was, I argue, an intellectual parvenu. He actually began his career as a military clerk, following his father's occupational footsteps and being trained in the same office. Yet, sometime in his twenties he caught an intellectual bug and decided to acquire for himself the substance of a madrasa education while never formally attending one. He would spend much of his subsequent life trying to prove that he was as qualified and knowledgeable as those who had attended the madrasa, still the most prestigious space for an education in the seventeenth-century Ottoman world. And while he did garner some recognition, I argue that he never fully escaped from his initial training as a bureaucrat. Even the names by which he is most commonly known—Katib Çelebi and Hajji Khalifa—were monikers that meant “the gentleman scribe” and “the clerk who went on hajj.” In fact, the works for which he became famous are largely clerks’ work, acts of grand compilation and tabulation rather than the logic-centered formalistic theorizing of madrasa-based scholars. Ironically, the scholasticism of seventeenth-century madrasa-based scholars has lost its sheen today, but Katib Celebi’s database construction is more highly recognized today in our society, which helps explain why Katib Celebi is recognized as an exemplar.

Who Speaks for Medicine in Early Modern South Asia? ***Eric Moses Gurevitch, Vanderbilt University***

In medieval and early modern South Asia, the

physician Vāgbhaṭa was literally synonymous with medicine. Derivatives of his name came to be equated with the practice of medicine in several regional languages in South Asia. And his writings were translated into Tibetan, Arabic, and Persian, serving as the model of "Indian medicine" for diverse intellectual projects. But this did not mean that Vāgbhaṭa was beyond critique. In this presentation, I use a debate about the authority of Vāgbhaṭa between Saura Vidyādhara and Bhaṭṭa Narahāri to examine the notions of canonical texts and exemplary individuals in early modern South Asia. In something of a "pamphlet war," these two intellectuals wrote competing monographs disputing the position that Vāgbhaṭa should hold in the medical pantheon. The epistemic tools developed by philosophers writing in Sanskrit were put to new uses in assessing the validity of medical texts, which meant that new scrutiny was brought to the ethics and identities of authors like Vāgbhaṭa.

Session Organizers:

Shireen Hamza, Northwestern University

Eric Moses Gurevitch, Vanderbilt University

Chair:

Tara Nummedal, Brown University

106. Making Time: Temporal Imaginaries of Scientific Practice

Organized Session

10:00 to 11:30 am, Saturday 9 Nov.

Holiday Inn: Lobby Level - Maya

Ideas about "imperfect pasts" and "uncertain futures" have long preoccupied not only historians, but also the scientific actors we study: scientists and technology workers in the modern period demonstrate a strong awareness of time. Their research priorities and activities are often articulated with reference to contemporary interpretations of the recent past, selective valuations of deeper history, and desires for the realisation of particular futures. The work of scientists is thus an inherently temporal undertaking: one determined by not only the actual passage of time, but also by how specialists comprehended and explicated this passage of time themselves. Accordingly, this panel will examine a series of different temporal imaginaries and their political stakes in scientific fields ranging from aviation engineering to archaeology, human genetics, ethnography, and the demarcation of time through astronomical calendars. These case studies encompass Japan, the Middle East, and Indigenous North America. In these different contexts, we explore and critique how scientific actors defined their knowledge-making practices as homage to ancient achievements, improvement over recent pasts, response to present crises, and progress toward better futures. Simultaneously, we analyse how temporal imaginaries informed professional identities, generating both community and conflict within and between national and regional spaces. By foregrounding scientists' deployments of various universalizing temporalities, including queer history, futurism, nationalist or religious eschatologies, and anti- or decolonial chronologies, we show how scientific time is actually deeply contingent, relying on specific shared political and social commitments. The panel centers non-European historical actors not only to highlight how they situated themselves alongside or against hegemonic Euro-American temporalities, but also to reflect on how HSS might reconsider its own temporal imaginaries.

Participants:

Queer Salvage Ethnography and Two-Spirit Temporality *Eli Nelson, Massachusetts Institute of Technology*

In 1992, editors of Ethnographic Studies of Homosexuality declared, "Time is running out; when the last tribal Papuan can tune in to the 'Gay Liberation Hour' with his satellite dish, traditional field work will be at an end." In the midst of the AIDS epidemic and globalization, gay ethnographers were anxious to announce that the hunt for scientific evidence of authentic Indigenous sexual and gender deviance was on. Between 1986 and 1995, a group of largely white gay anthropologists in the United States, including Will Roscoe, Stephen O. Murray, and Sue-Ellen Jacobs, sought to break their field's 'glass closet.' They developed methods for what I call "queer salvage ethnography," and their published works portrayed a sexually diverse Indigenous world supposedly threatened by backward homophobia in the global South, on one side, and colonial progress in the global North, on the other. This paper explores the ways in which a new queer Native subject was straddled in changing conceptions of (post)colonial historicity and temporality. Drawing on archival records of the Gay American Indians organization in San Francisco, I trace the story of how queer Native community organizers in the early 1990s critiqued and lobbied for the abolition of the anthropological gender category "berdache." GAI prioritized interrogating what Mark Rifkin calls the "bribe of straightness" that compelled Indigenous and postcolonial communities alike to conflate tradition and heterosexuality. It was through these conversations that the term "two-spirit" was adopted as a futurist umbrella

category for non-heterosexual Indigenous gender and sexual expression, leaving the queer salvage ethnographers to search for timeless deviance elsewhere.

Indo-Persian Print Culture, Decolonial Knowledge, and Calendric Reforms in 19th-Century Iran ***Delbar Khakzad, McGill University***

During the 19th century, Iranian reformists promoted a new understanding of time that linked a new Indo-Persian notion of cyclical time (dawr) to a linear conception of time and progress. Previous scholarship has detailed how the temporal imaginaries of Middle Eastern and Muslim societies in this period were influenced by local intellectuals who constantly compared themselves to European industrial and technological achievements and desired a coeval status with Europeans. This presentation examines how changing conceptions of time in Iran were shaped by cultural exchanges and the dissemination of print culture between India and Iran. In this context, I will demonstrate how Indian Zoroastrians' writings promoting a return to the ancient pre-Islamic past and Iranian scientists' experimental fusion of Zoroastrian and (Shi'i) Islamic values offered an alternative to Westernization. These ideological commitments manifested through calendric reforms in Iran, anchoring progress to a redefined understanding of time. Among these calendric reforms, I focus on Iranian scientific debates about the lunar Hijri calendar used throughout the Islamic world, and its fusion with solar calendars. Specifically, Iran's first state-run scientific periodical revived the Jalali calendar, a medieval Iranian solar calendar originally computed from astronomical observations in Isfahan and using ancient Sasanian month names. Subsequently, Iran's royal astronomer Abd al-Ghafar Najm al-Dawlah created the Hijri-Shamsi calendar still in use today, using a fusion of elements of the Hijri and Jalali calendars to consolidate a unique Iranian temporal sensibility of "solar Islam." I contend that these calendric reforms are an example of how 19th-century Iranian scientists constructed nationalist and decolonial knowledge frameworks, produced by intensified transnational interactions propelled by steam and print technologies and competitive economic globalization.

Futures That Never Were: Futurism and Speculative Design in Japanese Aviation, 1920-1939 ***Subodhana Wijeyeratne, Purdue University***

In March 1936, the aviation magazine Sora (Sky) began featuring a column called Sekkeika no yume ("Designers' Dreams"—later, Shinsekkeika no yume, "New Designer' Dreams"). The space provided the opportunity for a variety of designers to let their imaginations run riot on speculative designs ranging from airborne carriers to an assortment of flying wings. What is striking about this work is the inherent role of temporality in the way these designers conceived of their profession. The writers existed in a period when self-conceptualisations of specialism were becoming increasingly intertwined with a sense of mastery over time. Many early aviation designers in Japan grew up reading the imported works of science fiction by writers such as Edgar Allen Poe, Jules Verne, and H.G.Wells–work often transformed time from an abstract quantity to a topography conducive to being explored by individuals, if only they had the right technology. Such notions inevitably spilled over into technical and aviation specialists in Japan; as Shinsekkeika no yume shows, aviators had come to understand their professions not only as resolving the problems of the present, but as designing a better future–and, crucially, purveying such futures to the public. This presentation shows how a combination of hope and anxiety underlay their visions of the future, and how they presented their designs, and themselves, as a key tool in mastering these futures. Ultimately, it will show how the speculative futures of these designers gave way to a future that few could have imagined–one of total war, atomic weapons, and a Japan forced at gunpoint to confront its own imperialist past.

"Piercing the History of Asia": Postwar Japanese Science in the Middle East ***Elise K Burton, University of Toronto***

Between the 1950s and the 1970s, Japanese archaeologists, anthropologists, and geneticists made their first forays into Iran and Iraq to conduct scientific fieldwork. Contemporary publications and media coverage depicted this moment as a Japanese scientific rediscovery of "West Asia," a region to which Japan was connected not only through the deep time of human evolution and the prehistory of civilization, but also through more recent

shared political experiences as “Asians.” This presentation focuses on the 1956-1966 Tokyo University Iraq-Iran Archaeological Expedition and a 1972 Japanese medical genetic investigation of northern Iran. Using scientific publications and archival materials, I analyze how the experience and outputs of collaborative work between Japanese, Iranian, and Iraqi scientists was shaped by four overlapping conceptual timescales: human evolutionary time, racial time, imperial time, and decolonizing time. These timescales were sometimes explicitly invoked, and sometimes implicitly embedded in ideas about the history of “Asia” or “Asians.” Evolutionary time justified the scientific research, with all parties locating the origin of human civilization in West Asia. Meanwhile, Iraqi and Iranian scholars encouraged Japanese scientific collaboration as a signal of decolonizing time, a present moment of asserting control over research initiatives in their sovereign nations and seeking new Asian partnerships circumventing colonial links to Europe. Underneath these visions of shared Asian time lurked conflicting frameworks of imperial time, through Japanese scientists’ own role in colonizing East Asia, and racial time, through scientists’ fixation on tracing historical processes of racial differentiation and admixture. I argue that these overlapping temporal imaginaries brought together Japanese and Middle Eastern scientists while simultaneously creating frictions and ambivalences detectable in their research publications.

Session Organizers:
Elise K Burton, University of Toronto
Subodhana Wijeyeratne, Purdue University

Chair:
Projit Bihari Mukharji, Ashoka University

Commentator:
Projit Bihari Mukharji, Ashoka University

107. Scientific Expeditions

Contributed Paper Session
10:00 to 11:30 am, Saturday 9 Nov.
Fiesta Americana: Lobby Level - Salon Celestun

Participants:

Violence as Pedagogy: Discipline in Victorian Exploratory Expeditions in Africa, 1840 to 1900 ***Miguel Angel Chavez, Cumberland University***

In John Petherick's 1862 exploratory mission along the Nile, an adjunct recounted how he ended a fight between two sailors under his command, by having “boxed them both most impartially.” Likewise, Lionel Decle gave ten lashes to an Askari for "disobedience." Rather than being isolated instances of violence, Western travellers frequently relied on such violence to maintain order within the expedition’s ranks. Western explorers from the 1840s onwards did not shy from using corporal punishment to maintain what they considered to be “order.” Be it by way of beatings, lashings, or forced labour, explorers used a variety of means to control the porters, labourers, and soldiers critical to the success of exploratory missions. The level of violence increased in later decades, as both Samuel White Baker and Henry Morton Stanley used military force to quell native African resistance to encroaching imperial rule. I argue that so-called explorers in Africa assumed a right to punish grounded on the liberal assumptions that legitimised the “civilizing mission:” that non-Western peoples were akin to children and that violence served as a pedagogical tool of civilizational uplift. In turn, these violent acts bolstered the legitimacy of explorers as “men of science” in the eyes of metropolitan audiences by dramatically connecting field science with bloodshed and notions of "progress." In examining field diaries, published narratives, and the secondary literature on colonial violence, I hope to provide a better understanding comes to light about how explorers used violence and coercive measures to discipline their non-Western subordinates.

Realization of a Pan-North American Natural History: U.S. Expeditionary Field Biology in Mexico and Central America: 1890-1914 ***Matthew Laubacher, University of Arizona, Global Campus***

As the nineteenth century came to a close, naturalists in the United States looked to expand their understanding of North American natural history by extending their research beyond U.S. borders. In the quarter century prior to WWI, U.S. naturalists sought to expand upon previous collection efforts along the U.S./Mexico border by developing systematic collection trips focusing on Mexico and Central America. The most well-known of these were headed by the U.S. Biological Survey, but other institutions, such as the Field Museum in Chicago, increasingly targeted Mexican and Central American flora and fauna for study in this period. In contrast to earlier Humboldtian collections in the borderlands, these collection efforts were systematic, if limited, in scope.

This transition that mirrored evolving field practice in the United States that favored a small number of field naturalists working semi-autonomously. These naturalists, such as E.W. Nelson and Edmund Heller, were well versed in the theoretical approaches of natural history in the United States, and were thus able to incorporate biological and geographical data into “American” systems of knowledge. The prewar focus on Mexico and Central America culminated in numerous surveys of, and the Smithsonian’s development of a permanent tropical research institute in, Panama in the early 1910s. Collectively, these research expeditions demonstrate the increasingly imperialistic nature of “American” natural history, as well as paved the way for larger and more extensive surveys of Central and South America in the interwar period.

Cold Superpower Science: The Arctic, Territorial Expansion, and the Possibilities of Modern Research: 1945-1960 ***Emma Lorraine Armstrong, Southern Methodist University***

At the turn of the 20th century, the Arctic had yet to be fully incorporated into superpower militarization and industrialization. By 1950 however, the superpower Arctic nations were deeply invested in the region, heavily influenced by the imperatives of the Cold War. This study will examine how the competitive nature of Cold War science in the 1950’s opened this once-impenetrable desert of ice for human expansion and use. When you take a wider look at inventions created through government-funded R&D, as well as the breakneck speed of competitive, security-based science, it becomes easier to see how the Cold War interacted with the Arctic. The technological and scientific advances allowed for the Arctic to belatedly be incorporated into the longer history of exploration, harkening back to a time when superpower nations did not possess the capability to industrialize the unforgiving landscape in any systematic way. As the “unclaimed” Arctic was wrested away from the indigenous way of life that had flourished there for centuries, an exploitative resource-and-military-focused culture was superimposed onto the region. Expanding national control, scientific understanding, and resource monopolization in the region mirrored historic examples of territorial expansion—even if only symbolically—at a time when demonstrating national power was most important. It is in this way that Cold War ideologies became increasingly intertwined with the performance of one’s nation in the Arctic. The ability to operate in the unforgiving environment demonstrated technological and military prowess, contributing to the prestige of the superpowers.

Chair:

Michael Reidy, Montana State

108. Space and Place in the History of Science: Where Are We Now?

Organized Session

10:00 to 11:30 am, Saturday 9 Nov.

Fiesta Americana: Lobby Level - Salon Mérida

The ‘spatial turn’ in the history of science demonstrated the importance of space (and place) not merely as a backdrop for thinking through various histories of science but as a co-producer of scientific knowledge and understanding. Yet, the idea that places build people and knowledge as much as knowledge and people build places suggests connections to a range of other theories and approaches that have yet to be explored. This panel invites discussion of the most recent approaches to spatial theory in the history of science and technology. How do scholars understand the role of space and spatial theory in the production and operation of scientific labour, knowledges, communities, or imaginaries? How might the study of space be combined with other ideas and approaches to better understand historical modes of scientific creation, circulation, and disruption? With questions like these in mind, presenters in this session examine new experiences of space through the construction of buildings and cityscapes as well as new understandings of space through mathematical and cosmological perspectives from the late nineteenth through the mid twentieth century. Together, these topics raise questions of differential power related to gender, sexuality, race, language, education, and class that point in new directions–to recent work in queer theory that might challenge our understanding of technology around the turn of the twentieth century; to intentionally “domestic” features of academic spaces that reinforce professional hierarchies; to non-elite perspectives of the heavens that offer untold histories of cosmology; and to travel between institutional and geographical centers and peripheries that test theoretical claims to universalism. By examining personal and shared experiences of technology, architecture, knowledge of the universe, and universal knowledge, this panel aims to highlight what we have learned from the study of space and where we might go next.

Participants:

'Disorientation' and the History of Technology in Turn-of-the-Twentieth-Century America ***Sean Cosgrove, University of Southern California***

Historians of the Gilded Age and Progressive Era regularly invoke the language of 'disorientation,' especially in the context of technological, infrastructural, and social transformations that defined the era. The height and magnitude of urban skyscrapers (from 1885), subterranean tunnels of underground transit systems (from 1897), the introduction of standard (railway) time (1883), the dazzle of electric lighting (America's first department store lit up in 1878), and the exponential production of newspapers and other print media are all regularly described as 'disorienting' phenomena. But what does 'disorientation' mean to historians who invoke these terms, or to those contemporaries who are recounting their experiences? If we consider orientations in spatial terms, what were our historical actors failing to be oriented towards (or, in other words, 'disoriented' from)? How does disorientation actually work and what is its significance in light of its widespread usage by contemporaries and scholars alike? As queer and spatial theorists have shown, any understanding of "social relations as spatial relations" demands attention to moments of dislocation as containing possibilities for slippages in social agreements and values. Through an examination of uses and representations of scientific and technological 'disorientation' in American fiction and news reporting at the turn of the century, this paper explores the 'unsettling' that was required to produce American modernity; to create an environment primed for the re-imagining of social, cultural, economic, and political relationships. Ultimately, this paper argues that 'disorientation' should not merely be understood as a neutral descriptor of rapid technological change but rather as a tool for historical analysis, representing the historical process of and itself enacting paradigmatic social change.

Domesticity at Work: University Buildings and the Gendering of American Mathematics ***Ellen Abrams, University of Toronto***

In October 1931, The New York Times announced the opening of a new building for mathematics at Princeton University. The Henry Burchard Fine Mathematical Hall would be "one of the most elaborate of its kind in the country" and was notable for its "offices that resemble living rooms." With no expenses spared, Fine Hall was intentionally designed to seem less like an office building and more like a well-furnished home, with special attention paid to comfortable furniture, a kitchenette, and showers. The building would quickly become a center of mathematical, specifically masculine, prestige, in part through the gendered dynamics of domesticity. It would also become a model for the design of future mathematics buildings across the country. In this talk, I examine new mathematics buildings as gendered spaces by considering how they were designed to make some feel "at home" more than others. Specifically, I draw on prior studies of domesticity and architecture in the history of science to situate Fine Hall within the broader context of early-twentieth-century American mathematics and masculinities. Tied closely to insights from the "spatial turn," the "domestic turn" in the history of science has demonstrated the limitations of binaries like "public" and "private." And although knowledge produced in the home has been an important site of inquiry for historians of science and gender, my analysis asks what happens when the "domestic" is intentionally merged with the "professional." What role did the gendered dynamics of domesticity play in constructing the image of the professional mathematician? Overall, I argue that the elite spaces of mathematics in places like Princeton were central to the image of elite scholarship that emerged from new forms of professionalization in the 1920s and 1930s.

Cosmic Space in Early American Popular Ideas ***Trent MacNamara, Texas A&M University***

As late as the 1830s, most Americans lived in profoundly three-dimensional worlds. Relevant space extended upwards into the heavens. Much of what mattered on earth came from the sky: weather originated above; fates were decided there; perfect justice was available there. Most people lived mostly outdoors. Distractions for the eyes and mind were few; light pollution was nearly non-existent. Crucially, the heavens were open to all, regardless of earthly station. They had no human masters. They belittled despots and savants, offering everyone—poor and rich, enslaved and free—access to "higher" truths. By 1900 personally relevant space had become flatter for millions of Americans. A new technical class gradually redefined the heavens' basic nature. Public schooling expanded; deep time and deep space landed in

textbooks. The spectroscope suggested the uniform chemical composition of earth and heaven. Powerful men reframed the old cosmology as parochial, retrograde, and childish. The ancestral universe—intimate, moral, fateful, overseen by a manlike sky deity—was the delusion of zealots, women, the poor, and the racially inferior. This paper surveys popular cosmology in the United States over the decades of its most rapid change. Historians have tended to imagine heavenly rhetoric as just that—rhetoric—and the sky as a blank canvas onto which religious and scientific authorities projected ideas for passive consumption by the masses. This view reflects the perspective of the most articulate. Thousands of forgotten laypeople left behind heavenly visions—often starkly literal visions that struck elites as vulgar. These visions flip the script in the history of cosmology. They show that the "heavens" were not just a rhetorical space but also a visible space that gave shape and power to higher ideas, connecting physics to metaphysics. The sky was not a blank canvas but an extra-human otherworld that allowed earthly society's outcasts to conquer fate and own transcendent things.

The Local Homeomorphisms of Global Mathematics ***Michael J. Barany, University of Edinburgh***

Elite mathematical research in the mid-twentieth century rapidly came for the first time in the discipline's history to accommodate and sometimes even to depend upon certain mathematicians' regular intercontinental travel. These mathematicians' itineraries tested their discipline's universalism, and the manifold assumptions mathematicians carried with them as they endeavored to produce new mathematics with new collaborators in unfamiliar places. Examining formal reports, correspondence, and the material culture of such travel, especially between the discipline's institutional centers and peripheries, I will characterize the costs and contingencies of aspiring to produce a kind of knowledge where place should be immaterial. Mathematicians commented upon and attempted to manage local differences among spaces of mathematical research, observing their environmental and cultural contexts, searching for appropriate writing media, and scrambling to stock local libraries with the right kinds of literature. They confronted matters of language, class, gender, and race as they accommodated the disorientations of mathematical travel. My analysis will develop a metaphor from differential geometry, of a homeomorphism between spaces, establishing a kind of formal equivalence between spaces through a comparison of the immediate surroundings of a mathematical (or mathematician) entity as it moves in each direction between spaces.

Session Organizer:

Ellen Abrams, University of Toronto

Chair:

Sean Cosgrove, University of Southern California

109. The Futures of Public and Academic Engagement in the History of Science

"Futures" Roundtables

10:00 to 11:30 am, Saturday 9 Nov.

Holiday Inn: Lobby Level - San Jacinto

Pedagogical approaches to teaching the history of science have shifted over the last several decades. Part of this shift comes from necessity: COVID-19 forced many scholars to reevaluate their methods for online instruction, virtually overnight. But as historians, we recognize that many of those shifts were already in the making. While some surviving academic programs have expanded offerings of non-Western history, others have been forced to limit their number of courses offered, dropping early modern, medieval and specialized courses. History of Science courses are often in those courses dropped. This panel looks at new methodologies for pedagogy in the history of science, with a focus on expanding methods for diversity, both in subjects and students. Benjamin Gross will speak on the Linda Hall Library's partnership with the University of Zurich to build a public-facing online exhibition on the sun in early modernity. The Linda Hall Library has greatly increased their virtual fellowship program, in order to reach student and scholars more broadly and more accessibly. The new exhibition is just one of the many outcomes of moving available scholarship online. Sam Muka will present an analysis of seven years of quantitative data from her introductory course. In the course, she allows students to choose their topics of interest and has found that nearly 1/3 of each course chooses non-Western and pre-modern topics each semester. Her data suggests that there are important ways to build an expansive diversity of topics into introductory courses. Kathleen Shepard's talk will look at her methods for engaging upper division engineering students in the history of science. Her work combining hands-on activities with new digital methodologies, including Wikipedia, have led to an increased audience for history of science on her university's campus. Finally, Sarah Naramore will talk about how she builds "curiosity as pedagogy" in her

History of American Science course, the first history of science course offered at her university. The course, serving history and natural science students, offered students the ability to follow their own interests through keeping journals combining primary and secondary sources. Several assignments allowed this curiosity to both bloom and coalescence in a coherent classroom environment. This roundtable will jumpstart a conversation about how we can use new methods to teach more subjects and students as we move into the uncertain future of the humanities and history of science at increasingly shrinking institutions.

Session Organizer:

Samantha Muka, Stevens Institute of Technology

Participants:

Benjamin Gross, Linda Hall Library

Kathleen Sheppard, Missouri University of Science and Technology

Sarah Elizabeth Naramore, Northwest Missouri State University

110. Developing Environments, Producing Modernity: Histories of Science and Environment in International Development

Organized Session

10:00 to 11:30 am, Saturday 9 Nov.

Holiday Inn: Lobby Level - Santiago

Scholar and activist Walter Rodney defined development as a society's capacity for dealing with the environment, a capacity that depended on science and technology. In the early 1970s, at the time of Rodney's writing, international organizations, industrialized countries, and postcolonial nations utilized development rhetoric and techno-scientific intervention to shape local environments, particularly to increase the production of food. This panel speaks to Rodney's intersection of science, environment, and development by critically evaluating how regimes of international development produced expertise about managing, and optimizing, environments around the world. Various historical actors utilized development to construct certain forms of environmental change and natural resource utilization as modern and scientific, in contrast to previous agricultural methods. We ask how the environmental interventions directed by development experts produced intended and unintended social, political, and ecological change. This panel spans several regional contexts and focuses on international development in the second half of the 20th century. Through case studies in East Africa, Southeast Asia, and the United States, we explore how soil, plants, cows, and insects became objects of interest for scientists and development experts diagnosing how local food production practices should be altered. Amin resituates the history of famine that preceded the 1974 Ethiopian Revolution in a broader historical context by highlighting agricultural interventions in Ethiopia by U.S., British, and Dutch development organizations. Likewise, Tomar explores how the politics of famine in western India led to the promotion of dairy production and considers the relationship between caste and development. In independent Indonesia, Lee's work reveals the pluralistic social scientific understandings of agricultural modernization that shaped Indonesian food production, reflecting on both Indonesian and American agricultural history that shaped expertise. Prial examines the development projects of Austrian-American chemist Carl Djerassi, whose work in human contraceptives and insect control reflect the centrality of population management across species to the development imaginary.

Participants:

Reflexivity in 20th Century American Rural Social Science and the Non-Deterministic Trajectories of Indonesian Agricultural Modernization *Zhe Yu Lee*

In the decades following the Indonesia's independence, policies regarding agricultural modernization were influenced in large part by a tightly knit epistemic network. It consisted of American and Indonesian rural social scientists moving in and out of American (land-grant) universities, Indonesian agricultural universities, various government ministries in both countries as well as patrons at the Agricultural Development Council and Ford Foundation. On the one hand, Cold War geopolitical forces contributed to the scientization of knowledge regarding rural Indonesia and hence the ensuing focus on agricultural productivity and efficiency. On the other hand, meaningful heterogeneity existed within this epistemic network regarding not only the overarching direction of rural development that Indonesia should take, but also the adequacy of relevant epistemological frameworks to describe, support and/or critique these transformations taking place. I argue that these contestations were impacted by uncertainties regarding how state institutions should appropriately use social science to engender, regulate and/or manage rural social change. Crucially, these uncertainties did not only manifest themselves in the mid-20th century Indonesian context when institutional capacity regarding agricultural problems could be described as "weak." They also persisted within the very American institutions present in Indonesia, which from the 1920s-1940s were primarily responsible for the intellectual and

policy response to the contradictions emerging from early US industrial agriculture. This paper analyzes non-formal writings/reflections of specific Indonesian and American experts from the 1950s-1980s regarding how they contended with issues of trust in and legitimacy of social scientific knowledge production and state intervention. In doing so, I contextualize formal sources and government reports that at times aim to minimize interpretive flexibility about social change in rural Indonesia.

Dairy Developmentalism: Salvaging the Green Revolution in Postcolonial India, 1950-1970 ***Koyna Tomar, University of Pennsylvania***

In 1966, several parts of the Indian subcontinent plunged into a food crisis, worst in the history of independent India. Two successive years of famines prompted shifts in India's food policies. On one hand planners launched a new agricultural strategy focused on "integrated package" of high yielding variety seeds, credit, and fertilizers, often dubbed as "the green revolution." On the other hand, they supported efforts to ameliorate redistribution implications of this project by focusing on cooperative production and marketing. While historians have by large focused on the former, this paper turns to the latter. Nutritional, agricultural, and technological experts in western India emphasized expansion of food production and supply programs in dairy specifically. Dairy development was reframed as "synergetic intervention" that was not only economically sound, but also socially and ecologically efficient. This paper unpacks the ideological origins of dairy developmentalism in postcolonial India and emphasizes interlocking of regional histories of caste and capital with international developmental aid.

The Preface of Revolutionary Ethiopia: Famines, Nutrition, and Cold War Developmentalism (1950 to 1974) ***Adhip Amin***

The 1974 Revolution in Ethiopia that led to the abolition of a three-millennium year old monarchy and the resultant establishment of a Marxist-Leninist State was precipitated by devastating famines and food inflation between 1968 and 1974. Historians have so far interpreted the causes of this agrarian collapse in the nature of land ownership, variously described as pre-capitalist: feudal with Ethiopian characteristics, in the context of the expansion of food production. Another explanation that historians of Ethiopia offer is that, in the absence of longstanding colonial rule, "ethnic division" contributed to ecological and environmental crises. And on the whole, environmental scientists have interpreted the famines as a result of demographic acceleration: rapid rural population growth reliant on livestock production leading to the overgrazing of land and therefore, the depletion of soil fertility and the erosion of the topsoil. In this paper, I argue that even if famines are politicized in this moment of revolutionary change in Ethiopia, their explanations are ultimately autochthonous as they fail to take into account the commercialization of Ethiopian agriculture in the context of the intertwining between US Developmental Aid and the intensification of Dutch and British Capital during the Cold War. I argue that the interconnected depletion of soil nutrients and malnutrition amongst Ethiopians needs to be placed in the historical context of the political compulsions of the Cold War, wherein developmentalism and capitalism interlocked in the Awash River Valley with the dramatic expansion and intensification of the cultivation of sugar and cotton between 1950 and 1974.

Managing Multispecies Populations: Carl Djerassi and Cold War Scientific Development, 1960 – 1980 ***Brigid Prial, University of Pennsylvania***

Known as "the father of the pill," birth control researcher and chemist Carl Djerassi believed that the production of scientific research was integral to international development. Joining the U.S. National Academy of Sciences Board on Science and Technology for International Development (BOSTID) in the 1960s, Djerassi became involved in several development projects connected to his expertise in birth control. In 1967, Djerassi and Kenyan entomologist Thomas Odhiambo established the International Center of Insect Physiology and Ecology to address the problem of insect pests that reduced the crop yields of Kenyan farmers. Simultaneously, in the United States, Djerassi founded an insecticide company to monetize his work on the interruption of insect reproduction. In the early 1970s, Djerassi planned a chimpanzee breeding and research station in Zaire with BOSTID. He hoped that the chimpanzees produced there could serve as animal models for his own birth control research, which would eventually benefit the people of Zaire by reining in what he perceived as unfettered population growth. This paper examines how Djerassi's work managing reproduction across species – human beings,

chimpanzees, and insects – constructed relationships between certain species and the consumption of natural resources as crucial development problems. Though development is often considered a unilateral process, I highlight how participating in development work provided resources, access, and experiences to those historical actors who consider themselves development's architects rather than its subjects.

Session Organizer:
Brigid Prial, University of Pennsylvania

Chair:
Gabriela Soto Laveaga, Harvard University

111. "Nuclear Nepantla: Cold War Legacies in the Southwestern US and Northern Mexico"

Roundtable
10:00 to 11:30 am, Saturday 9 Nov.
Fiesta Americana: Lobby Level - Yucatan I

Nuclear Nepantla activates the Nahuatl term nepantla to refer to a third space or shared region apart from adjacent nation-states that is united by the topic of nuclearity, which Gabrielle Hecht defines as the broad spectrum of political and technological activities that relate to nuclear capacity. In an effort to decolonize colonial narratives of nuclearity, this roundtable seeks to unpack nuclear colonialism, "a neocolonial framework that targets not only Indigenous people but also other ethnic minority groups and poor economic situations that have become disenfranchised because of state occupation of their homelands" (Gómez, Nuclear Nuevo México 5) in the US-Mexican borderlands. Previous studies have treated the Trinity explosion as the end of something, like the death of innocence, or as its start, like the birth of the atomic age. Instead, we explore this as a pivotal moment for people whose individual consciousness and community traditions began before and continued after detonation, and for the living landscape of a region where national borders and transnational experiences are the norm. With aspects of the nuclear fuel cycle ranging from the mining of uranium in Indigenous homelands to the burial of nuclear waste near the US–Mexico border, the US-Mexico borderlands is the target, or at least topic, of increasing public discussion. As the US enters a new Cold War with the creation of eighty new plutonium pits per year, we seek to discuss this contemporary history alongside the Treaty of Tlatelolco, which prohibits the development, acquisition, testing, and deployment of nuclear weapons. The scholars on this panel seek to engage in a conversation that asks how communities in the US-Mexico borderlands have become nuclear nepantlerxs. Participants work across the disciplines, in US-Mexico Borderlands History, History of Science, Chicanx and Mexicanx literatures, Critical Regional and Southwest Studies, Indigenous Studies, and Cinema and Visual Cultures

Session Organizer:
Peter Soland, University of Houston-Downtown

Chair:
Edna Suárez-Díaz, Universidad Nacional Autónoma de México

Participants:
Dmitri Brown, University of Michigan
Myrriah Gómez, University of New Mexico
Jennifer Jenkins, University of Arizona

112. Global History of Science: Between Circulation of Knowledge and Collaborative Networks

Organized Session
10:00 to 11:30 am, Saturday 9 Nov.
Fiesta Americana: Lobby Level - Yucatan II

The Global History of Science focuses on the decentralization of specific geographical locations as "centers of knowledge production" and highlights communication, exchange, interaction and movement that transcend (temporal, disciplinary, even geographical) borders. If we consider the circulation of knowledge not only as the spatial extension of the places where it is practiced, but also the processes of translation and resignification of knowledge between epistemic communities, it is possible to recognize that local approaches and concerns about nature have been in dynamism with the global environment of scientific production. This approach also discusses the theoretical-conceptual and material tools that have made it possible to understand and benefit from the world through interpretative models that simplify its complexity, such as the concepts of evolution and inheritance, or scientific machines and instruments. The above, considering that the circulation of knowledge also implies its teaching, application and commercialization. Thus, the aim of this session is to show that the history of science is a field that, besides offering us a reconstruction of its evolution, evidences the relationships between the production of local and global knowledge, and discusses the scope of the theoretical and conceptual tools that have been used to understand the phenomena of life -biological and social-.

Participants:

The Global Turn in the History of Science: what the Cold War Left us ***Ana Barahona, Universidad Nacional Autonoma de Mexico; Erica Torrens, Universidad Nacional Autonoma de Mexico***

The post-World War II period witnessed an entirely new phase of globalization that embraced almost every corner of the world, integrating and densifying previous historical

interconnections, and impacted almost every field of the social sciences and humanities, and the history of science is no exception. Recent studies in the history of science have attempted to move away from the nation as the privileged unit of analysis, as well as from Eurocentric narratives, cultural-diffusionist interpretations, and the "center-periphery" binary, to examine the role of global and local circulation of scientific knowledge, people, artifacts, and practices in the dynamics of scientific knowledge production and certification. The aim of this paper is to explain how we move away from European and U.S.-centered narratives to explain the role of transnational networks of exchange and the circulation of knowledge, people, artifacts and scientific practices in this recent historiographical model of Global History.

Teaching the History of Science in a Global Context: an Experience at UNAM, Mexico City, and its Appraisals ***Marco Ornelas-Cruces, Universidad Nacional Autónoma de México***

This paper describes the design and the teaching of a Global History of Science course for undergraduate and graduate students in the sciences and humanities at the Department of Evolutionary Biology of the Universidad Nacional Autónoma de México (National Autonomous University of Mexico; UNAM) in Mexico City during the second semester of 2022. The objective was to analyze the (re)writing of the History of Science as a purely Western phenomenon in the decades after World War II; the challenge of this vision from outside the West; and recent approaches inspired by the new relational, or transnational, historiographies. We also aim to show the difficulties and challenges of this course, some of which were language, infrastructure, the difference in educational levels, the effect on graduate students' projects, and the design of didactic strategies for undergraduate students.

Social Control and Eugenics after Mexican Revolution ***Brian Becerra-Bressant, Universidad Nacional Autónoma de México; Alicia Villela, Universidad Nacional Autónoma de México***

In the first decades of the 20th century, eugenic ideas proposed by Francis Galton were introduced and popularized in the discussions of Mexican scientists and intellectuals. These discussions justified population control and attempts to eradicate “hereditary” diseases such as prostitution, epilepsy, poverty and venereal diseases, among others. Since 1900, in Mexico, different sectors of the medical community expressed their concern for public health problems. In 1910, the booklet ‘Higiene de la especie: breves consideraciones sobre la stirpicultura humana’, by Francisco Fernández, was published, and, a year later, an article on eugenic programs for racial improvement in Mexico. Propaganda campaigns were also implemented in public buildings, schools, theaters, markets, hospitals and cemeteries. Finally, through the Mexican Eugenics Society, the Mexican press was persuaded to disseminate negative eugenics and, although this did not have great transcendence, in Veracruz, in July 1932, a sterilization law was decreed which, in practice, never proceeded. This paper attempts to show how, in Mexico, the interpretation of Darwin’s evolutionary theory, together with the ideas of biological inheritance of the time, promoted a eugenic explanation to justify the social control of “inferiorized” populations. In addition, it aims to analyze the appropriation, circulation and development of Galton’s theses after the Mexican Revolution, with the intention of understanding Mexico’s role in the global reception of eugenics.

Spicy entanglements: Rethinking Conservation and Sustainability through Gendered and Local Knowledge ***Daniela Sclavo, University of Cambridge; Irama Núñez Tancredi, Universidad Nacional Autónoma de México***

Scientific institutions have historically neglected actors and practices that promote biocultural diversity through local and embodied knowledge or saberes. This is particularly the case for indigenous and peasant women. Yet, significant research has evidenced how women’s culinary and ecological knowledge, alongside collaborative networks, are fundamental for biocultural conservation and for attaining sustainable food systems. In this talk, we explore the case of chile (Capsicum spp) conservation by women cooks or cocineras in the last decades of the 21st century in the community of Santo Domingo Tomaltepec, Oaxaca, Mexico to highlight the importance of knowledge and practices that circulate, and resist, beyond the validation of Western science. In valuing other epistemologies and the connection of people with their territories is that more equal dialogues between different types of knowing becomes possible. Therefore, parting from feminist and decolonial perspectives, this story

represents an opportunity to rethink approaches in crop conservation and sustainability sciences.

"If you seek the use of the compass go to the Fungi": The Lincei, 'The Tesoro Messicano', and the making of 'The Assayer' ***Kevin Lambert, California State University, Fullerton***

A prominent historian of Galileo once argued that 'The Assayer', which was published in Rome in 1623, might justly be called Galileo's "scientific manifesto". The occasion for its publication, a controversy on the nature of comets that had begun when three appeared in the sky above Italy in 1618, remains the context for much of the discussion about 'The Assayer'. Less attention has been paid to the importance of the first scientific Academy, the Accademia dei Lincei and their leader Prince Frederico Cesi in the writing and publication of 'The Assayer'. Cesi and the Linceans broke off work on their own project, a natural history of New Spain that they would eventually call the 'Tesoro Messicano', to enable the publication of 'The Assayer' in the early 1620s, and returned to that work as soon as it came out. To recognize the closely shared aims between Galileo and the Linceans is to put the publication of 'The Assayer' into a wider context, one that reaches beyond the discussion of the comets in the sky above Rome, or indeed the instrument makers and patrons of Northern Italy, to trade networks and cultural pathways that go back centuries and cover the globe. This paper will explore this larger perspective to show how a wide array of actors, many of whom were non-European, were involved in the making of 'The Assayer' and of the early modern sciences.

Session Organizer:

Marco Ornelas-Cruces, Universidad Nacional Autónoma de México

Chair:

Kapil Raj, École des Hautes Études en Sciences Sociales

113. Lost Objects: Histories and Futures of Collections

"Futures" Roundtables

10:00 to 11:30 am, Saturday 9 Nov.

Fiesta Americana: Lobby Level - Yucatan III

Sponsored by the CALM Caucus Considering the growing uncertainty of funding for historically-focused institutions around the globe along with the critical reviewing of the imperial colonial foundations of many of these institutions,we find ourselves at a critical moment for reflection. This roundtable will explore the ever-changing meaning of the objects in our collections, looking at how the smallest unit of an institution can tell us its actors' values through what they collected and what they discarded or ignored and why. By highlighting specific objects in these collections, presenters will open the conversation about the future of our professions and institutions. By discussing their objects' imperfect pasts and uncertain futures in a post-truth society, the forces that have imbued them with value, and the reasons why they were collected. The place of the archive, library, and museum is being renegotiated and its future is uncertain.That is why we propose that only through an understanding of the communities originating of these objects is the only way to think about the future of our institutions, a future that must include the participation of these communities. Let us discuss what lies ahead and how we can make our collection work more inclusive and better for future generations.

Session Organizers:

Adrianna Link, American Philosophical Society
Catarina Madruga, Museum für Naturkunde Berlin, Humanities of Nature

Chair:

Elena Canadelli, University of Padova

Participants:

Luis Felipe Eguiarte Souza, Pavek Museum
Olin Moctezuma Burns, University of Cambridge
Nathan Smith
Anna Toledano

114. Water, Wind, and Fire: Colonial Science and Indigenous Knowledge in Latin America

Organized Session

10:00 to 11:30 am, Saturday 9 Nov.

Fiesta Americana: Lobby Level - Yucatan IV

"Water, Wind, and Fire" investigates the tensions among Spanish colonial science and Indigenous knowledge in Latin America from the sixteenth to the eighteenth century. Focusing on Colombia, Guatemala, Mexico, and Nicaragua, the authors examine the efforts of either Spanish or Indigenous populations to control their natural surroundings and further their own ambitions to extract mineral wealth, advance imperial expansion, navigate water-related disasters, or preserve cultural traditions. Spaniards in Nicaragua and Colombia undertook massive endeavors to extract gold from impossible places, such as the depths of a lake or a lava-filled crater, often with limited success as the environment thwarted their efforts. The natural world exerted pressure on colonialism in other ways, such as in the Yucatán, Mexico, where Spanish and Indigenous peoples faced the simultaneous threats of hurricanes, droughts, and epidemics, compelling them to devise strategies to mitigate losses. In highland Guatemala, Indigenous

Maya hastened rains and calmed the wind utilizing weather magic – ritual and scientific practices – that also risked attracting the attention of colonial officials who understood them only as sorcery. Together, these papers grapple with the ways in which Spanish and Indigenous understandings of science, technology, and the environment differed, influenced one another, and revealed and exacerbated power divisions among and between these competing groups. Often impeded by their environments, these colonial actors ultimately developed new knowledges about lake aquatics, volcanic behaviors, rain, hurricanes, and droughts. Their ideas became entangled as a crucial component of Spanish colonialism, while also contributing to nascent early modern natural history and science.

Participants:

A Lake of Gold: Colonial Investigations of the Masaya Volcano in Early Sixteenth-Century Nicaragua ***Megan McDonie, University of Texas Rio Grande Valley***

The Masaya volcano, located in western Nicaragua, presented the Spanish conquistadors with a quandary upon their arrival in the region in 1522. The active volcano contained a lake of churning lava, a rare volcanic phenomenon. Uncertain whether this reflected a satanic horror or extraordinary natural wonder, the Spaniards monitored Masaya's behaviors and pondered over the presence of "gold" within the mountain. Their curiosities culminated in a monumental endeavor to extract the fiery golden liquid. They relied on Indigenous knowledge and labor, new technology and tools, and a bit of luck as they risked their lives to descend into Masaya's scorching crater and collect the mysterious molten matter. The gold extraction efforts proved fruitless, but the endeavor led the conquistadors to collect observations and theories about the volcano and its causes. Using their eyewitness accounts, chronicles, correspondences, images, and diagrams, this paper highlights how these Spanish and Indigenous investigators interpreted and interacted with Masaya. It argues that that their efforts incorporated the volcanic environment and subterranean world into Spanish colonial policies. In an era before volcanology, these investigators left a provocative foundation about the inner workings of the earth and its influence on human life above.

Confronting the Caiman in the Mud: Indigenous Knowledge and Labor Practices in the Sixteenth-Century Draining of Lake Guatavita ***Katherine Godfrey, Pennsylvania State University***

This paper explores Indigenous knowledge and labor practices during the exploration and draining attempts of Lake Guatavita (1570s-1590s). Spaniards understood the lake, including the surrounding mountains and caves, to be huacas, or spiritually charged sites that held caches of gold and precious stones as offerings to Indigenous ancestors and deities. The obsession over these huacas and the supposed wealth contained in them fueled Spanish hunger for gold, which manifested in a massive financial undertaking that involved the importation of tools, enslaved Africans, and Indigenous laborers both locally and as far away as the Canary Islands. How, though, did local Spaniards convince not only the Crown, but themselves, of the worthiness of this great economic and ecological endeavor? And in what ways did the desaguadero, or draining project, depend on local, Indigenous knowledge of aquatic spaces to even conceive of its completion? Through a close reading of imperial and local level petitions, correspondence, and proof of merit petitions housed in Colombia and in Spain, this paper dives into how Spaniards learned of the supposedly sacred nature of Lake Guatavita and the critical role that free and enslaved Indigenous and African laborers had in lake draining efforts. I argue that the myth of finding El Dorado, or the "Golden City," in the vast forests and bodies of water of South America absolutely fueled Spaniards' rapacious activities, yet it is in this desperate attempt to drain a massive lake that scholars can better understand who controls myths, why, and their consequences.

Syndemics and Disasters: Hurricanes, Epidemics, and Colonialism in Seventeenth-Century Yucatán ***RA Kashanipour, University of Arizona***

From decade-long outbreaks of smallpox and measles to recurrent eruptions of typhus and influenza, epidemic crises shaped the everyday experiences of the inhabitants of colonial Yucatán. So endemic were these diseases that Diego López de Cogolludo, the great chronicler of the seventeenth century, remarked that "it was rare for someone to even pass through the land and without falling sick with one epidemic disease or another." Across the colonial period, from the sixteenth and into the nineteenth centuries, the region served as the mainland entry point for Old World diseases, which often

came alongside ecological disasters, such as droughts and hurricanes. This paper address how indigenous populations of colonial Yucatán lived with and negotiated interwoven recurring crises of epidemic diseases, environmental disasters, and economic calamities. Using a mix of indigenous and Spanish language sources, I examine how syndemic crises of disease and natural disasters shaped the nature and production of knowledge alongside colonial relations.

"Calling the Rains": Weather Magic as Indigenous Agricultural Knowledge in Highland Maya Communities in Eighteenth-Century Guatemala ***Martha Few, Pennsylvania State University***

In Santa Cruz Chiquimulilla in May 1788 five Maya men, all town elders and community office holders, stood accused in the local ecclesiastical court of being “rain bringers.” Testimony elicited from these men for “calling the rains” and “diverting strong winds,” provided details of weather magic practices in the region, as well as the words of three oraciones or prayers in Maya and translated in the documents. This paper examines evidence for weather magic among highland Maya ethnic groups in eighteenth-century Guatemala and Chiapas found in court documents, ecclesiastical visitas, Kaqchikel language sources and dictionaries, and other materials. Weather magic practices supported the health of local communities and ensured good harvests of local crops in rituals that took place in area milpas (traditional Maya plots of corn, beans, and squash), cotton and indigo fields (important colonial export crops), and in caves, hills, and other ritually charged spaces. To contextualize these colonial-era sources, I weave into my analysis evidence on agricultural rituals from pre-Columbian Mesoamerica codices and ethnohistorical evidence from contemporary highland Maya practitioners. Colonial weather magic cultures reveal that Maya ritual and scientific practices worked in tandem to understand and transmit Indigenous knowledge of weather and the environment to future generations that included the reading signs in plants and animal behavior to anticipate and divert dangerous winds and weather, manipulate rain, wind, frost, and other elements, ease and end droughts, and control or repel animal, bird, and insect infestations that threatened agricultural plant health and bountiful harvests.

Session Organizer:

Megan McDonie, University of Texas Rio Grande Valley

Chair:

Martha Few, Pennsylvania State University

115. Reproductive Science: Comparative Perspectives on the Past; Global Inspirations for the Future

"Futures" Roundtables

12:00 to 1:30 pm, Saturday 9 Nov.

Fiesta Americana: 1st Floor - Izamal I

This futures roundtable brings together six scholars to discuss the past and future of reproductive science in Mexico, Brazil, the United States, and the Mexico/U.S. Borderlands. Two scholars will speak in Portuguese, two will speak in Spanish, and two will speak in English. The organizer and commentator will speak in Spanish. All participants will bring slides with a translation of their main speaking points (those presenting in Portuguese and Spanish will translate their speaking points into English, and those speaking in English will translate their speaking points into Spanish and Portuguese). This session employs a decolonial and global south-centric lens to historicize the contemporary politics around hormonal contraception and other synthetic estrogen prescriptions, as well as the use of mifepristone with misoprostol to terminate pregnancy. The speakers—all experts on reproductive science in historical, comparative, and STS perspectives—will connect their historical discussions to recent changes in abortion law in their country of focus, all of which have recently seen increasing restrictions on abortion access, the decriminalization of abortion, changes in abortion law, and/or intense feminist mobilization in favor of individuals' ability to self-administer pharmaceuticals. Central to this discussion is a Latin American approach to reproductive justice, which conceives of a lack of access to healthcare as a state-sponsored form of violence against groups of people as a whole. This panel will celebrate Latin American and transnational and feminist approaches to scientific politics and emphasize their place in histories—and futures—of science. This roundtable includes a variety of historical and contemporary perspectives on reproductive science. The commentator, Ana María Carrillo Farga, is a pre-eminent scholar of science, medicine, and public health in Mexico. She has offered to read the participants' work and briefly address the themes and continuities in the panel as a whole during the Q&A. Elizabeth O'Brien also works on these topics and will moderate the panel. Five minute comments will be delivered by each of the following participants: Jethro Hernández Berrones highlights Indigenous perspectives, focusing on the appropriation, and

discursive erasure of, midwives' scientific knowledge in Mexico. Cassia Roth delves into the post-World War II feminist movement in Brazil, which began discussing the public health consequences of illegal abortion and the need for a sexual revolution. Martha Liliana Espinosa, an expert on the hormonal contraceptive pill in Mexico, will discuss Mexican family planning short films. These were produced by the Health Department, and tried to influence individuals' reproductive behavior in the 1970s. She will connect these to contemporary struggles over gender and pharmaceutical-based family-planning today. Also analyzing synthetic estrogen, Chloe Bell-Wilson takes a feminist approach to height-reducing medicine prescribed to adolescent girls in the 1950s U.S. Starting in the late 1950s, a less well-known version of prescribed estrogen entered the pediatrician's office to decrease the growth of girls predicted to grow taller than 5'10". Bell-Wilson shows that estrogen prescribed to address so-called "extreme" predicted height in young women marks an attempt to create a homogenous, conformist generation of women in the United States. The final two presenters will bring our analysis to the current day, focusing on abortion in Mexico and Brazil. Mariana Pitta Lima draws on oral histories to analyze reproductive technologies involved in abortion and post-abortion care at public maternity hospitals in Brazil. Génesis Luigi Bravo continues this important thread by interrogating boundaries of expertise and knowledge-making in the administration of abortion medication, which has been a revolutionary tool to advance reproductive justice and transform medicalized understandings of abortion provision and safety. Whereas mifepristone with misoprostol self-administration is increasingly criminalized in many U.S. states, Mexico's 2021 Supreme Court ruling explicitly decriminalized any and all abortion care, even outside the bounds of licensed care providers. Yet, not all Mexican states abide by the ruling and many continue to arrest and criminally charge abortion providers while denying abortion access to the most vulnerable Mexicans. This roundtable features a range of time periods and nations, while it is also grounded in specific research projects that are under active development by students and early career scholars. Each scholar will frame their research in response to the same questions: how might these histories shift the historiography on gender and scientific expertise? What do they tell us about the future of reproductive politics?

Session Organizer:

Elizabeth O'Brien, University of California, Los Angeles

Commentator:

Ana Carrillo Farga, Universidad Nacional Autónoma de México

Participants:

Cassia Roth, The University of Georgia
Jethro Hernandez Berrones, Southwestern University
Génesis Luigi Bravo, Yale University
Martha L Espinosa Tavares, Duke University
Chloe Bell-Wilson, University of California, Los Angeles
Mariana Pitta Lima, CIDACS/Fiocruz: Salvador, Bahia, Brazil

116. Agrochemical Knowledge and Control

Organized Session
12:00 to 1:30 pm, Saturday 9 Nov.
Fiesta Americana: 1st Floor - Izamal II

Chemical and synthetic fertilizers and pesticides have served not only as tools for the improvement of crop yields, but also as tools for the governance and control of farmers, farming communities, and agricultural supply markets by states, corporations, and global systems. This panel explores the historical use of chemical knowledge and chemical substances to reform and to discipline agricultural practices and commodities at national and local levels. Across farms in the United States after the end of slavery, Egypt under British colonial rule, and the Taiwanese countryside during the Cold War-era Green Revolution, these speakers reflect on the intersection of chemistry, agriculture, and the environment for farmers and other agricultural experts on the receiving end of regulation and modernization. This panel is organized and sponsored by the HSS Forum for the History of the Chemical Sciences (FoHCS) and co-sponsored by the Society for the History of Alchemy and Chemistry (SHAC).

Participants:

Rings of Fire II: Arsenic Cycles through Racism and Empire ***Jayson Maurice Porter, University of Maryland***

This paper traces the history of arsenic from its cycles through geology, biology, and society. Starting with arsenic as a byproduct of volcanic activity that served living organisms before the planet filled with oxygen, this analysis follows arsenic's transformation into a toxin to oxygen-breathing organisms. First, this essay argues that arsenic contamination in the Americas starts with plate tectonics and the eastern edge of the Ring of Fire that stretches from western Canada through the U.S. and Mexican West and down the Pacific Coasts of Central America and South America. Second, this essay argues that, in addition to cycling through geological and biological histories, arsenic contamination is also a byproduct of arsenic cycling through racism and empire in

the Americas. This cycling took different forms in different countries, but with a focus on Mexico and the United States, this essay will detail how arsenic connected histories of extraction from settler colonialism and anti-blackness to mining to agriculture.

"Fertilizer from the Air": Popularizing Agrochemical Knowledge in Egypt ***Omri Polatsek, Max Planck Institute for the History of Science***

This paper explores the popularization of agrochemical knowledge—ideas about the relationship between fertilizers, pesticides, soils, and plants—in popular scientific writing in Egypt from the 1880s to the 1920s. It seeks to understand how agricultural chemistry emerged as the dominant medium for the "modern" understanding of soil improvement and agriculture development in the country under British colonial rule. More specifically, this paper studies how Egyptian experts—agriculturalists, chemists, and soil scientists—produced, translated, and popularized agrochemical knowledge in Arabic to the (newspaper reading) public. It contextualizes the discussions about the relationship between fertilizers, pesticides, soils, and plants, both in the global discourse of Western "agricultural science" and in the ecological, economic, and social contexts of occupied Egypt. The analysis reveals that agrochemical knowledge was not merely 'transplanted' in the Egyptian context but translated to and anchored in local epistemologies and was shaped by the colonial realities of Egyptian cotton monoculture.

The Productive Tropics: Chemical Fertilizers and the Green Revolution in Cold War Taiwan ***Leo Chu, University of Cambridge***

This paper examines the politics of chemical fertilizers in Taiwan in the 1950s and 60s. After its defeat in the Chinese Civil War, the Republic of China (ROC) was relocated to Taiwan. To buttress the regime's legitimacy, the ROC technocrats enacted a land reform program to turn tenant farmers into landowners and organized them into associations for the distribution of agrochemicals, seeds, and water. Chemical fertilizers, imported with US financial aid, and the fertilizer-responsive rice varieties became a crucial technology to discipline the countryside: farmers were required to barter their rice for fertilizers at a disadvantageous rate, and the government used the cheap rice to sustain its industrialization projects. The government then sought to extend the improved yield from rice to other crops like vegetables by promoting intercropping and crop rotation practices. The system also caught the attention of American scientists who sought to turn tropical Asia into a productive environment through agrochemical-intensive farming—a vision that would be called the "Green Revolution" and spread across the US-led anticommunist alliance. The paper thus contextualizes Taiwan's role in the Green Revolution and the ecological consequences of excessive fertilizer use in the Cold War geopolitics.

Bringing Uniformity to Chaos: Regulating Agricultural Chemistry in the U.S. ***Colleen Lanier-Christensen, Harvard University***

In the 1880s U.S., agricultural chemistry was in chaos. State anti-fraud legislation had solidified the role of chemical analysis in agriculture through the establishment of new fertilizer inspection, testing, and labeling systems. How these analyses should be performed, however, was disputed. Different chemists used different methods, which produced different results. Which were correct, and which should be the basis for market valuation? Government and manufacturing chemists' methods produced markedly different claims about artificial fertilizer contents, which generated a scientific and social need to standardize testing practices. In 1884, government chemists formed the Association of Official Agricultural Chemists (AOAC) to develop, test, and approve standard methods for determining agricultural products' contents, thereby establishing nationwide regulation of a commercial enterprise and effectively seizing from manufacturers the power to set prices. This paper examines how methodological discord in agricultural chemistry destabilized the U.S. fertilizer market, left regulatory efforts on unsteady ground, and brought government and manufacturing chemists' interests into alignment. The AOAC legitimized official chemists' expertise and authority while simultaneously producing definitive results for product labels, facilitating commerce.

Session Organizer:

Charlotte Abney Salomon, Science History Institute

Chair:

Jessica Varner

117. Observing the Observatory

Contributed Paper Session

12:00 to 1:30 pm, Saturday 9 Nov.

Holiday Inn: Lobby Level - Maya

Participants:

Capturing the Stars: Women's Networks and the Advancement of Science at Yerkes Observatory, 1895-1940 ***Kristine Palmieri, University of Chicago***

Women at Yerkes Observatory in Williams Bay, Wisconsin, participated in the work of the observatory alongside their male colleagues as peers. Thanks to the work of an interdisciplinary research team at the University of Chicago, we now know that these women were able to earn advanced degrees, conduct their own research, collaborate on projects with individuals of both sexes, author publications in their own names, and advance the work of the observatory in substantive rather than merely computational ways. Yet these women did not wind up at Yerkes by happenstance. A significant majority had degrees from eastern women's colleges or co-educational institutions such as Carlton and Swarthmore Colleges. More recently the team has thus been working to uncover the larger scientific, educational, and personal networks in which the Yerkes women participated through research in the archival collections of women's colleges such as Smith, Mt. Holyoke, and Vassar, Columbia and Harvard Universities, as well as the papers of Mt. Wilson and Lick Observatories. In this paper, the team's historian will discuss preliminary finding from this most recent stage of the Group's research, foregrounding the extent to which, although the lives and labor of the Yerkes women are all but invisible in public records, their scientific work – and the voices – remain preserved in archives across the United States.

"You take our stars": Astronomers and Empire in the Andes, 1889-1898 ***Alex McGrath, University of California, San Diego***

The Arequipa Observatory (1891-1927) in Arequipa, Peru, established by the Harvard College Observatory to photograph the southern sky, brought U.S. and European scientific ideals into contact with a Peruvian worldview of national development and modernization. From archival sources of journals, correspondence, publications, and photographs of the Observatory's first decade in operation, I argue that Harvard astronomers served as unlikely brokers for empire, who articulated an apparently benign mission of universal scientific modernity at odds with the nationalist modernity of their Peruvian hosts. I approach these contested modernities from two angles, material and intellectual: (1) in labor relations, which reinforced a scientific production hierarchy built along racial and gendered lines, with the white gentleman scientist at the head of a shifting chain of foreign professionals, middle-class Peruvians, Indigenous laborers, and family women whose work sustained the observatory's production; and (2) through photography, travel-writing, and political commentary that cast the Andean world as a subject for Northern scientific and anthropological study, critiqued in terms of national development and progress. Beyond documentation of imbalanced power relations in knowledge production, this paper contributes to a growing body of work on science and empire that explores how scientific knowledge emerges from the tension between the needs for its local production and the effects of its wide circulation. Ultimately, I question the nature of the Observatory's contribution to Peruvian modernity, showing the processes of extraction that made the southern skies, and people, a raw resource for Northern scientific progress.

Infrastructure, Technopolitics, and Transnational Collaborations in the Creation of the National Astronomical Observatory of San Pedro Mártir ***Cristina Eugenia Siqueiros, Universidad Nacional Autónoma de México***

The creation of the National Astronomical Observatory of San Pedro Mártir in Baja California was driven by scientific necessity, as the existing facilities were inadequate to meet the requirements of Mexican astronomers. My work delves into the intertwined scientific, political, and international factors that contributed to the establishment of this new observatory, emphasizing the complex and costly infrastructure required. I aim to answer the questions of why and how this site of knowledge was established. The quest for new, large, and sophisticated instruments to equip the observatory project created technological, technical, and economic demands within Mexico. Thus, negotiations for support, including financial backing, were necessary at various levels, from the local, (requesting it from the Mexican State and the Universidad Nacional Autónoma de México); to transnational scales, (emphasizing the significance of scientific collaborations). Unlike

other sciences during this period, astronomy was not prioritized in international projects influenced by development discourse. Nonetheless, Mexican astronomers exhibited nationalist ideologies and a strong sense of national pride and sovereignty, impacting the observatory's evolution. By analyzing the interests of both parties involved— Mexican astronomers and the national or international subsidiaries— a clearer understanding emerges of the political, economic, and scientific dynamics at play. This study highlights the significance of infrastructure, technopolitics, and transnational collaborations in shaping the observatory. This research aims to illuminate the scientific, political, and economic contexts, contributing the relatively underexplored history of Mexican astronomy in the second half of the twentieth century and adding to the history of astronomical observatories.

Chair:
Ronald Doel, Florida State University

118. Authors Roundtable: New Books in the History of Science and Medicine
Authors Roundtable
Authors Roundtable Session
12:00 to 1:30 pm, Saturday 9 Nov.
Fiesta Americana: Lobby Level - Salon Celestun
Participants:

By the Numbers: Numeracy, Religion, and the Quantitative Transformation of Early Modern England *Jessica Otis, George Mason University*

My first book, "By the Numbers: Numeracy, Religion, and the Quantitative Transformation of Early Modern England" came out from Oxford University Press in December 2023. It explores the complex transformation of numeracy as a technology of knowledge in sixteenth- and seventeenth-century England. In the Authors Roundtable, I will talk about the methodological and source challenges of writing a cultural history of numeracy, which required bridging disparate historiographies and creatively engaging with other disciplines to address silences in the archival sources. I will also discuss the way my current digital history project--Death by Numbers, which is transcribing and quantitatively analyzing the seventeenth- and eighteenth-century London Bills of Mortality--grew out of my research for the book. More generally, I will talk about the challenges and opportunities of working at the intersection of history, mathematics, and the digital.

The Education of Things: Mechanical Literacy in British Children's Literature, 1762-1860 *Elizabeth Fabry Massa Hoiem, University of Illinois at Urbana-Champaign*

The Education of Things: Mechanical Literacy in British Children's Literature, 1762-1860 (UMass Press, 2024) reveals the class politics behind the playful literature, toys, and learning aids created to teach reading along with science, technology, and economics. I argue that with the rise of manufacturing, skillsets once associated with physical labor, such as tinkering or experimentation, became essential new literacies for an industrial economy. To maintain their social position, wealthier families taught their children "mechanical literacies," or the ability to interpret the laws governing how things are manipulated, created, purchased, manufactured, and exchanged. To do this, families incorporated artisan practices into their nurseries and classrooms, teaching children to play-act the work of making things. At a time when few children did not work, the creation of instructional literature devoted to learning science and technology through play empowered children of leisure while defending child labor as educational. To make this argument, I analyze a diverse archive of children's materials: literacy and science toys, Newtonian physics books, political economy and manufacturing books, and amateur craft books, and working-class grammar books. This interdisciplinary book offers scholars a portable concept of "mechanical literacy" to describe the essential skills mythologized during the industrial era as indispensable for social advancement. Combining words and putting things together signaled children's potential to make knowledge and design machines—and to fully participate in political and economic systems. Authors thus claimed mechanical literacy for different social groups to argue for more (or less) inclusive forms of representative government.

Beyond Mestizaje: Contemporary Debates on Race in Mexico *Milena Ang, Universitat Pompeu Fabra; Tania Islas Weinstein*

This roundtable discussion will draw on the insights from our forthcoming edited volume Beyond Mestizaje (Amherst College Press, April 2024) to explore how concepts of race have changed in Mexico in recent years, as well as how different epistemological and methodological approaches study racialization

and its effects. By bringing together scholars from a variety of disciplines as well as activists and public intellectuals, our book highlights how the study of race has shifted from mostly emphasizing cultural and class elements of racialization to centering its attention on phenotypic traits and their relationship to race and racial discrimination. This change, we argue, not only shapes how Mexicans are classified and categorized—both officially and colloquially—but it also enables specific forms of solidarity and facilitates collective action in certain arenas while preventing others. We will use the chapters in our book to structure the roundtable and address the following questions: How have changing understandings of race shaped perceptions of race and experiences of racism? How do different epistemological and methodological approaches shape our understanding of issues like discrimination and oppression? How are racist and capitalist forms of oppression (and anti-racist and anti-capitalist struggles) in contemporary Mexico linked to different understandings of race and racial traits? In what ways are Mexicans' experiences with racism similar (and different) from that of their counterparts in the United States? By engaging with these topics, the roundtable aims to shed light on the complex and evolving relationship between social sciences and political action in contemporary Mexico.

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.

119. New Approaches to Historical Evidence: Rethinking Indigenous and Non-European Sources

Roundtable

12:00 to 1:30 pm, Saturday 9 Nov.

Fiesta Americana: Lobby Level - Salon Mérida

This roundtable critically examines how interdisciplinary methodologies, which engage with Indigenous, non-European, and non-traditional primary sources, change how we understand and write histories of science, medicine, technology, and the environment. How do the materiality, visuality, and orality of our sources influence questions and methods about knowledge production in non-Western worlds? How do different types of sources – their forms, movements, and preservation – compel us to rethink the underlying epistemologies of histories of knowledge making? Taking Indigenous ontologies and archives seriously requires thinking creatively about historical evidence. This panel thus draws on methodologies of historians, anthropologists, and archeologists, whose work spans Latin America, the Middle East, Southeast Asia, and Oceania. Focusing on khipus, or Andean knotted cords, Mack FitzPatrick challenges ethnocentric biases that mythologize writing systems and analyzes khipus as sophisticated communicative tools for data processing. Joe Genz draws on museum collections and oral histories to reveal how Marshallese navigational "stick charts" encode Indigenous environmental and maritime histories. By conceptualizing Filipino Indigenous tattooing as a form of "embodied history," Sebestian Kroupa invites researchers to expand their notions of how history was performed in non-European contexts. Drawing on an Ottoman technical treatise, Maryam Patton offers a comparative analysis that reframes histories of timekeeping and disrupts Eurocentric narratives about the role of mechanical clocks. Genie Yoo uses Islamic prayer books to unearth underlying practices of orality to enrich connected histories of vernacular medicine across the Indian Ocean. Collectively, these contributions present alternative methodologies for understanding Indigenous and non-European ways of knowing and uncover new horizons for more inclusive and less ethnocentric histories.

Session Organizers:

Sebestian Kroupa, McGill University

Genie Yoo, Dumbarton Oaks

Participants:

Sebestian Kroupa, McGill University

Genie Yoo, Dumbarton Oaks
Mack FitzPatrick, Harvard University
Joseph Genz, University of Hawai'i at Hilo
Maryam Patton, Harvard University

120. Testimonies, Testimonials, and Knowledge Making across the Early Modern World

Organized Session
12:00 to 1:30 pm, Saturday 9 Nov.
Holiday Inn: Lobby Level - San Jacinto

Testimonies and testimonials, whether produced by patients or practitioners, played a crucial role in knowledge practices across the early modern world. This panel interrogates the function of these texts in the construction of medical authority and in the production of natural knowledge across diverse settings including the Castilian empire, sixteenth-century Germany, East Africa c. 1650-1750, and late seventeenth-century Britain. Our papers demonstrate that physicians and other medical writers used testimonies and testimonials in a number of ways. For some, the collection and display of testimonials was a way to showcase their expertise and skills and a means to distinguish themselves within a crowded medical market. Here, as Rankin and Leong's talks contend, the lived experiences of the sick were gathered and repurposed for promotional purposes. A rich and full collection of testimonies or testimonials served to showcase a practitioner's extensive knowledge network and/or authenticate their practices. For others, reports and testimonies were a method to record medical encounters and communicate medical natural knowledge across time and space. By selecting whose experiences to record and which voices to amplify or silence, writers of testimonies constructed and reinforced social and knowledge hierarchies. As Barrera and Röder argue, reading testimonies against the grain offer us the possibilities to recover silenced voices and health and knowledge practices hidden by colonial archives. By bringing these four case studies into conversation, this panel aims to reassess and interrogate the place of testimonies and testimonials across diverse knowledge contexts in the early modern world.

Participants:

From Colonial Testimonies to Imperial Knowledge in the Making of Empire, Knowledge, and Headaches (The Case of Indigenous Physicians and a Castilian Doctor) ***Antonio Barrera-Osorio, Colgate University***

In this paper, I examine the relationship between Indigenous physicians—agents in a colonial setting and an imperial agent, doctor Francisco Hernandez, and their co-production of knowledge in the sixteenth-century Castilian Empire. I look at how their testimonies point to simultaneously different knowledges. Empires add a new context to knowledge production by violently and otherwise placing people with different knowledge practices in proximity. It creates vertical and horizontal canals for knowledge production between people in different power positions. Take the emerging Castilian empire of the sixteenth century. The Castillian Empire transformed, in a matter of 40 years, the context for the production of knowledge. It brought together, by force, people with different histories, languages, practices, and knowledges. The Mexica knew how to cure cold diseases with cold medicines, cultivate chinampas, and establish markets; the Inka knew how to listen to rocks, build roads, and keep accounts with strings and knots; the Castilians knew how to talk to crucifixes, cross the ocean, and keep accounts with paper and ink. The Castilian Empire brought together these knowledge practices, transforming how people knew things in the empire. Some types of knowledge became more prominent and central for the empire; other types of knowledge became more prominent and central for the colonies. Knowledge emerged from the material and human messiness of empires. Indigenous and imperial physicians engaged in transmitting knowledge via testimonies and reports, validating some practices and marginalizing others.

Letters Hanging from Every Church Steeple: Testimonials, Visual Evidence, and Expertise in Early Modern German Surgery ***Alisha Rankin, Tufts University***

This paper examines the role of testimonials in demonstrating medical expertise in early modern Germany. It focuses on the differing approach to testimonials in the writings of two sixteenth-century specialist surgeons, a hernia specialist named Caspar Stromayr (d. ~1565) and an oculist and bladder stone specialist named Georg Bartisch (c.1535-1607). Both men authored German-language works that included illustrated depictions and descriptions of surgical operations – Stromayr an ornate manuscript on hernia surgery (1559), Bartisch a printed book on eye disease (1583). Written independently of one another, these treatises both use illustrations as epistemological evidence of surgical skill. The two men held very different opinions, however, about a different kind of evidence: testimonial letters issued by happy patients or governmental authorities. Itinerant healers collected such testimonials and often displayed them in

market stalls or other public spaces. Stromayr derided these “imposters” who hung their false letters “from every church steeple and town hall.” Bartisch, in contrast, spent years gathering testimonial letters as an itinerant surgeon. He prefaced his 1583 book with a thirty-page summary of his collected testimonials and published a stand-alone booklet in 1599 with the full text of those letters. In his view, his signed and sealed testimonials distinguished him from fraudulent, illiterate itinerants who merely called to patients from market stalls and displayed falsified surgical instruments and wares. These differing views of testimonials provide a window on the cutthroat surgical marketplace and highlight the interweaving of visual, material, and textual evidence in trying to prove professional skill.

Healing and Being Healed. Medical Testimonies and Cross-Cultural Encounters in Early Modern East Africa *Brendan Röder, Ludwig Maximilian University of Munich*

The proposed paper analyses medical testimonies in the context of encounters between European and non-European actors in East Africa (ca. 1650–1750). European missionaries and other travelers were often called upon to treat patients as diverse as enslaved individuals (in houses, on slave markets, during slave transports) and rulers such as the Badi III. of Sennar or Iyasu I. of Ethiopia. At the same time, in many situations, they themselves sought help from a variety of local medical practitioners (local physicians and wise women, fellow European and non-European travellers). On a methodological level, the paper focuses on how such mutual healing encounters were narrated and transmitted through written correspondence and printed works and asks whose voices were heard and recorded to validate another person’s medical authority and skills. As I would like to argue, despite their often biased and fragmentary nature, tracing medical testimonies in these texts can demonstrate how fluid the roles of healer and patient were and to what degree the hierarchies between different types of medical knowledge and authority were (still) in motion. In conjunction with the other papers in the panel, the aim is also to investigate how different colonial and non-colonial contexts influenced the production of medical testimonies within evolving political and professional hierarchies.

Testimonies, Epistolary Communities, and Promotion of Chemical Medicines *Elaine Leong, University College London*

This paper investigates the various ways in which the chemical operator Christopher Packe (c. 1657- c.1708) utilised testimonies to promote his medical business. An active drug producer and seller, Packe ran a successful laboratory and medical practice in Little Moorfields just outside the London city wall. Packe eagerly utilised print as a medium to advertise his drug business and penned several works including the Armanmentarium Chymicum (undated), Mineralogia (1693) and Medela Chymica (1708). While the Amanmentarium documents the breadth of Packe’s drug enterprises, the other two works offer a glimpse into Packe’s drug testing experiments in which he sent new drugs (at a price, of course) to medical practitioners across the country and invited them to return detailed accounts of their trials to be communicated with others in the “chymical common weal”. Subsequently shared in Packe’s printed works as “Histories of Cures”, these user testimonies were used to showcase successful cures and to persuade readers (and potential buyers) to purchase the drug in question. This talk reconstructs Packe’s “mail order” drug experiments and analyses the function of practitioners’ (and a few patients’) testimonies in launching new medical products, demonstrating drug efficacy, and constructing medical authority and expertise. It juxtaposes Packe’s work against other cognate schemes which utilise epistolary networks to build up collections of natural knowledge such as the collation of medical observationes or reports. In so doing, I highlight the commercial and promotional dimension of Packe’s activities and extend our understanding of knowledge production via correspondence.

Session Organizer:
Alisha Rankin, Tufts University

Chair:
Hannah Marcus, Harvard University

121. Sciences of Vulnerability

Organized Session
12:00 to 1:30 pm, Saturday 9 Nov.
Holiday Inn: Lobby Level - Santiago

Concepts of vulnerability have functioned in myriad ways in the sciences since the eighteenth century while largely eluding synthetic historical analysis. Along with cognates such as sensitivity and precarity, human vulnerability has been an object of investigation in natural- and social-scientific contexts as varied as

the abolition movement and humanitarianism, physiology and medicine, human rights, Cold War engineering and military strategy, and development economics. And yet vulnerability is an unusual scientific object. A science of human vulnerability is simultaneously a gesture of humility and a bid to circumscribe, and find ways of overcoming, our limitations. This session will address questions such as: How have the sciences theorized the relationship between vulnerability as a condition that is at once universal and unique to marginalized individuals and social groups? If vulnerability denotes that which is worth preserving, how have sciences of vulnerability sought to isolate facts from values? What effect does labeling a population as vulnerable have on the people labeled? Is the attempt to locate and quantify vulnerability an act of scientific humility or hubris? Understanding vulnerability historically also involves asking how its absence was imagined. What solutions have been proposed to mitigate vulnerability, and what were their political effects? Through asking these questions, this panel will critically reflect upon how the sciences have sought to measure and contain vulnerability, and the effects this has had on those designated as vulnerable, on scientists, and on the organization of infrastructure, philanthropy, and the state.

Participants:

Sensitivity and Vulnerability: Responding to Signals and Climate ***Rahul Mukherjee, University of Pennsylvania***

Electrosensitives—also referred to as people suffering from electromagnetic hypersensitivity (EHS) —display intolerance for and susceptibility to signals from mobile phones, Wi-Fi routers, and cell antennas. I analyze their condition within a longer history of plant, animal, and human sensing related to these different species' responses toward electricity and electromagnetic signals. In these scientific and social histories, the term sensitivity has had varied connotations and has been understood in relation to sensing, sensibility, vulnerability, and feelings. While in some cases, sensitivity is equated to increased responsiveness and intelligence, ability to empathize and an openness to be transformed, in other cases, (hyper)sensitivity becomes pathological, a condition marked by irritability and frustration. Vulnerability, thought alongside its cognate term sensitivity, has often meant susceptibility to harm or being at increased risk, even as the concept has also been theorized as resilient responsiveness to adverse conditions precipitated by climate change (Shockley, 2023). Comparing examples of EHS with case-studies of individuals and communities considered sensitive and vulnerable to pandemics and climate change, I argue that theorizations and categorizations of sensitivity and vulnerability say as much about scientific measurements of exposures and setting threshold levels as about social understandings of consciousness, intelligence, and empathy. Analytic frameworks studying sensitivity and vulnerability as responses to pandemics, climate change, and electromagnetic signals will have to be flexible enough to trace such phenomena across local, national, and planetary scales in an ecological manner where the local is often connected to and inseparable from the planetary (Coen 2016).

Take Shelter: The Thermal Dangers of Other People ***Bharat Jayram Venkat, University of California, Los Angeles***

How did the body come to be understood as vulnerable to the effects of heat? As part of a larger project on the history of thermal physiology, this paper focuses on experiments performed in Manhattan, Kanas in the 1960s for the U.S. Army's Office of Civil Defense, as part of Cold War-era efforts to secure the American body (understood in experimental terms to be white, male, healthy, and young) against the dangers of multiple forms of threat. These experiments sought to artificially reproduce "shelter environments" as proxies for the conditions that Americans might experience in the event of an actual attack. I'll examine the conditions of these shelter experiments, focusing in particular on its scientific staff, subjects, procedures, and apparatus. In particular, I attend to the question of crowding. Overpacked shelters, it was feared, would result in overheated bodies. Shelter conditions both protected the body and created new vulnerabilities. Such concerns were mirrored by the designers of Cold War-era biohazard suits. Experiments conducted in climate-controlled chambers revealed that at high temperatures, the thermal conditions produced by wearing these suits could kill troops before the chemical exposure did. I aim to put this research into conversation with the anthropologist Edward T. Hall's writing of "proxemics"—the study of social ideas about space and distance—which he published in 1966, the same year as the shelter experiments. Taken together, I'll argue that the Cold War-era sciences of heat developed a distinct conception of bodies being

vulnerable to other bodies, mediated by heat.

Lines of Force: Skeletons, Tides, and the Scales of Global History ***Simeon Koole, University of Bristol***

How is vulnerability, or precariousness, a shared human and more-than-human condition which nonetheless varies historically? How does the condition of vulnerability constitute the 'world' of living beings? This paper builds on recent anthropological and phenomenological rethinking of 'precarity' from an individual economic condition to a shared existential one. It focuses on the bodies of deal porters who carried timber in London's docks in the 19th and early 20th century and investigations made into how their skeletons deformed under pressure. Deal porter skeletons, surgeon William Arbuthnot Lane argued in the 1880s, materialised 'lines of force', a concept derived from mid-19th-century theories of electricity and magnetism. This paper critically mobilises the concept of lines of force to examine how docker bodies and ecologies reflected and inflected transformations in global capitalism. It traces a longue-duree history of how changes in deal porter skeletons entangled with those in the cultivation of Swedish forests, the pace of logging and shipping, and the dredging of rivers in Sweden and Britain. It considers how these changes altered the River Thames's relation to its wider tidal basin, consequently exposing deal porters to weather and water building in the North Sea and to toxic chemicals borne on increasingly frequent floods. In so doing, the paper explores how lines of force connected seemingly unconnected historical processes at multiple scales and temporalities, so constituting the 'worlds' of different living beings. Ultimately, it argues that connected histories of human and more-than-human vulnerability offer a method for rethinking the 'global' of global history.

Session Organizer:
Simeon Koole, University of Bristol

Chair:
Deborah Coen, Yale University

122. Collaborative Futures: Tools for Collaboration from the Making and Knowing Project

"Futures" Roundtables
12:00 to 1:30 pm, Saturday 9 Nov.
Fiesta Americana: Lobby Level - Yucatan I

The Making and Knowing Project is an interdisciplinary, collaborative research initiative studying the intersections of art (craft making) and science (scientific knowing). Through collaborative text- and object-based research, hands-on historical reconstructions of past techniques, and the development of new digital tools, the Project created Secrets of Craft and Nature in Renaissance France. A Digital Critical Edition and English Translation of BnF Ms. Fr. 640 (hereafter "Secrets"); its publication in 2020 was the culmination of the Project's work to transcribe, translate, encode, and annotate Fr 640—a little-known how-to text of roughly 900 entries detailing artisanal processes, first-hand experiments in material transformation, and observations about nature and natural materials in and around sixteenth-century Toulouse. Secrets presents a rich and unique technical text in French transcription and English translation for the first time and situates its contents in their material and historical context. Fr 640 provides insights into the material, technical, and intellectual world of the late sixteenth century, and brings a better understanding of how and why nature was investigated, used, collected, and appreciated in early modern Europe. While the publication of Secrets marks a milestone for the Project, it by no means exhausts the potential of this extraordinary primary source to inform new histories of science and the practice of hands-on experimental pedagogy in the history of science and in the sciences. Since the completion of Secrets, the Project developed a variety of resources for teaching and research, including lesson plans for hands-on research, syllabi, and student activities and projects. The Project has also developed an easy-to-use publication tool, EditionCrafter, that will provide all basic requirements to publish a digital edition as a sustainable static site, tailored specifically (but not limited to) how-to texts and other STS primary sources. EditionCrafter builds on the underlying software created for Secrets, which was headed by Performant Software Solutions. This open source and customizable publishing tool will allow users to deploy their own texts, data, and commentary as low-maintenance digital critical editions. The ultimate goal of EditionCrafter is to enable a user without great technical expertise to install the required (open-source) applications, add their own textual source, and create a sustainable public edition with minimal effort and cost. This session will include short presentations on the Making and Knowing Project's tools for collaboration, including EditionCrafter, its feature set and navigation, and model editions that have been developed using the tool. The presenters will then lead an interactive workshop on the Project's tools for collaboration, with audience members on their laptops and tablets.

Session Organizer:
Pamela H. Smith, Columbia University

Chair:
Tara Nummedal, Brown University

Participants:

Tianna Helena Uchacz, Texas A&M University
Melissa Reynolds, Texas Christian University
Nick Laiacona, Performant Software Solutions LLC
Naomi Rosenkranz, Center for Science and Society, Columbia University
Terry Catapano, University of California, Berkeley

123. Deep Time and Theories of Migration: The Ideological Uses of Geologic Time from the Mid-Nineteenth Century to the Early Twentieth Century

Organized Session
12:00 to 1:30 pm, Saturday 9 Nov.
Fiesta Americana: Lobby Level - Yucatan II

This panel explores the uses that deep time as a category have been put to in cultures around the world. Since the nineteenth century, with the formalization of geology as a discipline, determining the age of the Earth has been a central aim of scientific epistemologies. We examine the way various disciplines—evolutionary biology, geology, and archaeology—advanced different narratives of deep time during this era. Together, our papers ask why distinct models of deep time emerged when they did: how they arose from and influenced their ideological and material contexts. The panel shows that models of deep time introduced between the mid-nineteenth century and the early twentieth were inextricably entangled with a shared set of questions related to human migration. We collectively argue that political questions of socio-cultural difference were integral to scientific theories on the formation of human life across geologic epochs. Our papers trace these issues through comparative discussions of scientific cultures in Britain, Europe, and the early Soviet Union. The panel uses these diverse cultural contexts to discuss theoretical foundations for understanding the ideological work of deep time as a scientific category operating within modern historiography. This panel discussion intersects with influential recent trends in history and cultural studies of science. One of the most prominent drumbeats across historical disciplines has been an effort to recontextualize traditional historiography within the deep, geological timescale of the planet. Our panel contributes to these conversations by calling attention to the multiplicity of models of deep time. When we as scholars speak about deep time, we implicitly point to a singular understanding of time that took shape recently and has been concretized in geological sciences. Our papers show the pre-history of contemporary understandings of deep time, illustrating the transnational development of these concepts. By engaging the political issues that shaped scientific thinking about temporality, we seek to discover the surprising assumptions and implications that circulated in the cultural contexts from which theories of deep time emerged. We stage this intervention over the course of three papers: 1. Muriel Bernardi's study of Charles Darwin's Origin of the Species (1859) and George Eliot's "Natural History of German Life" (1856), which examines the way evolution served as a way of understanding ethnic and social types in Victorian culture. Bernardi argues that both the slow cycles of natural history and the accelerated temporalities of modernity were understood equally to wreak material changes in the constitution of human biology. Bernardi's paper shows that this logic helped stabilize concerns about increased rates of mobility that threatened to decouple human development from a fixed relationship to a natural environment. 2. David AP Womble's study of late nineteenth-century geology in context of the mobility and admixture associated with imperial expansion. Focused on British texts produced at the fringes of empire, Womble's paper shows how the discourse of empire was racially differentiating populations while simultaneously incorporating them into shared systems of political economy. As Womble argues, narratives of deep time provided the logic for negotiating between racial difference and shared categories of instinct, impulse, and reflex on which theories of labor and population management were built. 3. Dmitrii Blyshko's study of early twentieth-century Soviet archaeology and the competing theories of stadialism and migrationism. Blyshko examines how early twentieth-century Soviet Marxist archaeology rejected any association between national borders, ethnicity, and race through the lens of stadialism. He contends that this perspective emerged in response to the looming threat of colonization of Soviet territories by European countries. Marxist Archaeology aimed to construct an alternative narrative that would liberate humanity from the burden of genealogical kinship.

Participants:

Charles Darwin, George Eliot, and the Natural History of Types *Muriel Bernardi, University of Pennsylvania*

This paper explores the shared concerns that inform the work of George Eliot and Charles Darwin, particularly their interest in "incarnate history," or the idea that group forms (be it kinship, social or species) develop evolutionarily over time and are materialized in the bodies of the members of those groups as an inherited birthright. The term "incarnate history" is an apt one for describing much of Darwin's thinking in Origin, but it pre-existed that 1859 text by some three years, having originally been coined by W.H. Riehl in 1856

and translated into English by George Eliot's review of Riehl's work The Natural History of German Life. The term captures what Eliot understands to be the "fundamental idea" at the center of Riehl's text, namely, that the forms of social groups are governed by slow, evolutionary processes that are themselves governed by a timescale that keeps pace with that of biological adaptation (Eliot 68). This shared evolutionary timescale between social and biological adaptation produces social ties built not on abstractions (or imaginary contracts), but on the shared capacity of individual bodies to materialize organic social formations. This relation to the group, by Eliot's accounting, was an endangered one: only visible in the peasant classes of Germany by the mid-nineteenth century, the harmonious link between biological and social adaptation was rapidly dissolving as a result of capitalist and liberal abstractions, which naturalized the individual as the basic unit of human life and enshrined rates of change that operated on a revolutionary model. I will argue in this paper that both these Victorians sought ways of bridging between these two scales: Darwin through revivifying a model of embryology known as recapitulation, and Eliot through the formal affordances of the novel.

Deep Time, Wide Empires ***David AP Womble, University of Houston***

This paper explores the historical formation of contemporary scientific understandings of deep time. It considers what it means that foundational knowledge and disciplinary practices of modern science regarding climate, ecology, and geologic time were produced in Europe during the nineteenth century. The engines of empire were integral to this history: evolutionary field work, archaeological and geological digs, and botanical and zoological naturalism all relied not only on the literal availability of colonial spaces, but also on an ideology that rendered them available as objects of knowledge. In fields such as the Environmental Humanities, scholarship has either a) taken the radical if somewhat unsustainable position of disowning modern climate science due to its connection to histories of oppression, or b) treated empire as something like a donor whose contributions supported research that we that we as scholars can now decolonize and disentangle from that donor's suspect ethics. By contrast, this paper is more interested in asking why? Why did ecological, climatological, and geological research emerge when it did—what function did it serve in the context of empire and political history at the time? I address these questions by focusing on the way the deep time introduced by geologists interacted with other important understandings of time in nineteenth-century Britain. Drawing on György Lukács's historical time, E.P. Thompson's standardized time, and Benedict Anderson's homogenous, empty time, I explore what deep time added to these temporalities of the modern nation-state. As empire expanded, I argue that the temporalities of instinct and cultural evolution that emerged from studies of the geologic record were necessary for incorporating colonial demographics into systems of population management.

Does Genealogy Matter for Deep History? The Gothic Problem through the Lens of Soviet Stadialism ***Dmitrii Blyshko, University of Houston***

This paper examines an early Soviet Marxist archaeological endeavor aimed at challenging the significance of genealogical kinship in humanity's deep history as part of Soviet anticolonial resistance. Rather than emphasizing genealogical ties, Marxist archaeology interpreted human history as shaped by the realization of social laws. This conceptual framework enabled Soviet archaeologists to contest territorial claims put forth by European imperialism. The study delves into how Soviet and German archaeologists in the 1920s to 1940s formulated distinct perspectives on the belonging of the Crimean Goths (a Germanic tribe settled around the Black Sea in Late Antiquity). German archaeologists identified similarities between the material cultures of the Crimean Goths and prehistoric Germans, concluding that these indicated a genealogical kinship. This perspective bolstered interwar Germany's claim to Crimea as part of its ancestral homeland. In contrast, Soviet archaeology posited that all cultures undergo similar stages of social development, offering an alternative explanation for observed similarities across regions. For instance, Soviet archaeologist Vladislav Ravdonikas argued in the 1930s that the material culture similarities between the Crimean Goths and German tribes stemmed from comparable levels of social development rather than kinship. While not entirely dismissing the potential for migrations, he emphasized that socio-cultural development was the primary factor shaping the Crimean

Goths. This perspective repositioned human groupings within a framework of social time, guided by universal laws of social history and local historical contexts, rather than the deep-time genealogy proposed by German scholars.

Session Organizers:
Dmitrii Blyshko, University of Houston
David AP Womble, University of Houston

Chair:
Pratik Chakrabarti, University of Houston

Commentator:
Pratik Chakrabarti, University of Houston

124. Hunger in the Americas, Science and Politics

Roundtable
12:00 to 1:30 pm, Saturday 9 Nov.
Fiesta Americana: Lobby Level - Yucatan III

Hunger is an ongoing form of racial, economic and environmental violence over regimes of land and labor. Hunger in the Americas is produced through the legacies of enslavement, the continuing negation of indigenous land occupancy, forced assimilation, welfare policy, labor exploitation, debt, plantation agriculture, unlivable geographies, and contaminated soils and waters. Hunger also haunts the scientific record. Science has served both to reveal and to naturalize hunger. World leaders, relief organizations, physiologists and social scientists lay the groundwork for what Sylvia Wynter calls the “new master code:” hunger defined a dividing line between the fully human, the First World; and the underdeveloped, the Third World, the less than fully human. This roundtable brings together scholars of hunger and science in sites across South and North America. We will address the following questions: Why are we talking about hunger at HSS? What does the history of science tell us about hunger? What are the politics and systems of power involved in making hunger known? How is hunger defined, measured, recognized? How did hunger and ‘the hungry’ become objects of counting and classification, science and governance? How is hunger publicized and mobilized toward (geo)political or institutional ends? Is hunger science a counter-revolutionary project? What role does expert knowledge play in reproducing forms of power and subjectivity? Can we say, following Arturo Escobar, that hunger is “produced” by structures of agrarian reform, green revolution, and rural development?

Session Organizers:
Dana Simmons, University of California, Riverside
Eve E Buckley, University of Delaware

Chair:
Stefan Pohl-Valero, Universidad del Rosario

Participants:
Eve E. Buckley, University of Delaware
Joel Vargas Dominguez, Universidad Autónoma Metropolitana (Iztapalapa)
Helen Anne Curry, Georgia Institute of Technology
Salay Leme Adriana, Universidade de São Paulo
Timothy Lorek, College of St. Scholastica
Dana Simmons, University of California, Riverside

125. How to See the Invisible: Radiation Protection and Internationalist Science

Organized Session
12:00 to 1:30 pm, Saturday 9 Nov.
Fiesta Americana: Lobby Level - Yucatan IV

Atmospheric weapons testing, radioactive fallout, nuclear accidents and other post-1945 practices exposed many populations to radiation levels that were either dangerous, or not. These papers explore how radiation became institutionally visible through standards of exposure, detection technologies, diplomatic and legal negotiation, monitoring devices, and radiation protection rules defining risk and responsibility. The panel engages directly with the imperfect pasts of technical knowledge systems, and implicitly with the tense futures of nuclear risk today. For all populations at risk of radiation exposure, even now, seeing it and tracking it—knowing definitively that it was there, and that it mattered for their health or their workplace experience—depends on technical, scientific expertise and also on official, even political, consensus. Systems that assessed radiation testified to its possible effects in a context in which even genuine radiation sickness could be interpreted as “hysteria” rather than a medical illness. Standards defined risk and established liability. Other systems of surveillance, including diplomatic collaborative arrangements that picked up various signs across large regions, collected key military data. On this panel, Loukas Freris explores how equipment and training enrolled a “less-developed” nation, Greece, in the nuclear order; Mary X. Mitchell considers nuclear liability at Chernobyl, tracking how legal regimes troubled traditional conceptions of sovereignty; Austin Cooper analyzes how a French nuclear test in the Sahara became a catalyst for international disputes about sovereignty in Africa; and Kapil Patil considers how IAEA standards operated at the borders of promotion, safety, sovereignty and internationalism. This session is coordinated with the Nuclear History and Tense Futures roundtable submitted by Angela Creager. If possible we would like these two sessions to occur in sequence on the same day.

Participants:

The Introduction of Radiation Protection Rules in Postwar Greece as Part of IAEA’s Collective Expertise ***Loukas Freris, Friedrich-Alexander-Universität Erlangen-Nürnberg***

This paper explores the International Atomic Energy Agency's efforts to globally regulate radiation protection in the aftermath of World War II, primarily through its Technical Assistance Programme—an extensive fellowship program, expert missions, and equipment provision. Despite the IAEA's lack of legal authority to impose its radiation protection standards on member states, the Agency's rhetoric stressed their value not due to their mandatory nature but because they encapsulate unparalleled “collective expertise” derived from the experiences of the world's most scientifically advanced states. This paper concentrates on Greece and the establishment of its regulatory framework as a result of the IAEA's Technical Assistance provided to the country from the late 1950s to the early 1970s. The argument posited is that the IAEA has disseminated its culture and transmitted its knowledge of radiation protection to Member States through fellowships and expert missions. These initiatives granted young scientists access to the Agency's “collective expertise.” By offering fellowships and expert missions, the IAEA afforded scientists from less developed countries opportunities to collaborate with counterparts from advanced nuclear states, thereby facilitating knowledge transfer and aiding in their integration into the scientific community. For Greece, which the IAEA classified as a less developed country in the late 1950s, the notion of “collective expertise” served as a gentle prod for the nation to adhere to the Agency's regulations. Indeed, the IAEA's radiation protection standards had a significant influence by integrating the country into the nuclear order and forming the basis of Greek national legislation.

Exposing the Boundaries of Nuclear Liability: State Sovereignty and Radioactive Contamination after Chernobyl ***Mary X. Mitchell, University of Toronto***

Radioactive contamination challenged traditional conceptions of state sovereignty and practices of international relations. Diplomats considered the role of the state in addressing the harms of nuclear reactor incidents during the1950s and 1960s. They bracketed these questions, however, in order to craft international legal regimes that would foster the widespread development of nuclear energy while shielding states from suits over atmospheric weapons blasting. National laws and international treaties facilitated the transfer of parts, plants, raw material, and technical expertise. Limiting liability for meltdowns and channeling it to plant operators, meanwhile, ensured the participation of private industry while leaving open broader questions about what role states might play in addressing transboundary harm. The catastrophic meltdown at Chernobyl raised these questions anew, exposing how the harms of nuclear technologies troubled traditional conceptions of sovereignty while creating opportunities and constraints in the field of public international law.

Technically Safe, Politically Dangerous? Forging Consensus on Saharan Fallout in 1960s Accra ***Austin Rory Cooper, Purdue University***

When French nuclear planners first tested their atomic bomb in the atmosphere above the Algerian Sahara in February 1960, winds that they had not anticipated carried radioactive debris from the explosion—known as fallout—across this desert and into many West African territories. French officials had made public guarantees that the fallout could not possibly travel so far from the desert test site. West African leaders—in Nigeria and in Ghana, for example—doubted French confidence, and they did not want to have to trust French reports after the blast, if French officials even agreed to release any. They would not do so. Nonetheless, international negotiations pursued by those African leaders had brought scientific experts to the region before the test shot occurred. Measurements the scientists took in its wake indicated radioactivity that French officials had insisted would not be there, but the scientists concurred that Saharan fallout did not reach levels high enough in West Africa to threaten human health. This paper examines how the scientists reached that consensus and how it shaped technical, political, and moral understandings of the French nuclear testing error. The French mistake transformed Accra, Ghana’s capital, into an international hub for negotiating radiation protection during the Cold War arms race. This paper begins by explaining why Ghana’s independent government turned to Canada for assistance with radiation monitoring on the eve of the French tests in Algeria, and why Canada agreed to provide this assistance. Next, it describes the forging of scientific consensus on Saharan fallout and its effects in West Africa, starting with atmospheric investigations into the surprising direction that the radioactive trajectories took above the

African continent. Finally, it shows how national identity informed debates in Western capitals whether they should participate in publishing the findings from West Africa. Unlike Paris, Ottawa and London determined that they hadmuch to gain from publicizing the consensus from Accra that Saharan fallout had not endangered the region's health and safety during an era of global nuclear politics when the problem of atmospheric weapons testing remained unresolved

Shifting Sands: IAEA and the Making of the Global Radiation Protection Standards *Kapil Patil*

How did the International Atomic Energy Agency (IAEA), a specialized agency of the United Nations (UN) produce the radiation protection standards from time to time? Moreover, what explains the progressive shifts in the radiation exposure limits stipulated in various editions of the agency's safety standards? The paper seeks to answer these questions by illuminating the underlying scientific and institutional determinants of the agency's radiation protection framework. From acute public concerns over the health effects of radioactive fallout from nuclear test explosions to divides across scientific and regulatory spheres on radiation effects, the making of radiation protection standards, we argue, involved concerted mediation of contending views, controversies and forging institutional consensus on scientific and regulatory aspects of radiation protection. The mediation of scientific controversies that, in turn, masked deeper political divides rendered standards-setting an innately diplomatic endeavour requiring the agency to mobilize a group of international experts to uphold its views on radiation protection while ensuring that the process remained institutionally representative. The progressive shifts in the wake of scientific controversies, however, also signified the limitations of scientific expertise to redress uncertainties in radiation effects, forcing the agency to undertake necessary course correction towards ensuring continued public acceptance of its standards.

Session Organizer:

Susan Lindee, University of Pennsylvania

Chair:

Jacob Hamblin, Oregon State University

126. GECC/CoDI Listening Session

Roundtable

1:30 to 2:30 pm, Saturday 9 Nov.

Fiesta Americana: Lobby Level - Salon Mérida

During the GECC listening session, we invite all graduate students and early career scholars to share any thoughts, concerns, and questions they may have. This helps GECC better plan for the year ahead and meet the needs of its constituents.

Session Organizers:

Iris Clever, University of Chicago

Claire Ann Votava, University of California, Los Angeles

127. Rethinking Psychiatry and Psychology

Contributed Paper Session

3:30 to 5:00 pm, Saturday 9 Nov.

Fiesta Americana: 1st Floor - Izamal I

Participants:

Clever Hans and the Marvelous Somnambulist: "Subjects" in Scientific Psychology *Daniela S Barberis, North Central College*

In this paper I will discuss a parallel transformation in animal and human performers as they were turned into subjects of psychological study: their transformation into appropriate scientific "subjects" entailed the removal of their agency, their reconceptualization as machine-like entities. While the transformation of humans and of animals in this way has been discussed by various authors, the fact that the animal/human change was analogous seems to have gone by without comment. On the one hand I will discuss the culture of public performance in magnetic experiments which developed in nineteenth century France and its changing character over time. On the other, I will discuss contemporary performing animals and, in particular, the famous case of "Clever Hans," a performing horse. Both animal and human performers became the focus of scientific delegations tasked with investigating their amazing feats. The various "explanations" offered for the phenomena cover an analogous spectrum: from claims of supernatural influence, paranormal phenomena and exceptional capacities to accusations of deception, voluntary and involuntary (conscious and unconscious). In both animal and human cases, we will see the wondrous performers transformed into purely reflex machines and deprived of agency as the alleged required entry price to pay for "objective" psychological knowledge.

"The Condition can no Longer be Ignored": Brain Trauma Models and Veterans' Self-assessment, 1918-1928 *Adam Negri, University of Minnesota*

The Minnesota War Records Commission (1918-1920) sought to enhance public health during the nascent period of psychiatric and neurodegeneration studies, funding a project that collected over 70,000 returning World War I veterans' self-health assessments. Specifically, engaging in self-diagnosis, the veterans were asked to report instances of potential head and brain injuries, including but not limited to "shell shock." Alongside this initiative, researchers in 1920s New Jersey began investigating reported instances of "punch drunk" brain-injured boxers. The desire to convert individualized narratives about trauma to recognizable and germane biomedical knowledge in the post-war period was widespread and would fundamentally impact how early neuroscientists attempted to chart a constellation of TBI-related symptoms that were, in their words, "purely of emotional, and therefore psychogenic, origin." These efforts resulted in methodological biases, favoring violent and masculine conceptions of TBI-related disease, that we still hold today. My paper repackages this public health initiative, particularly in relation to historiographies of the history of psychiatry and neuroscience, to highlight a critical, unexplored component of modern TBI clinical models. Using a stratified sample of the veterans' self-assessments, census data, birth and death records, and reliable population-level estimates of head injury for the time, I showcase how individual patient experiences, population-level health, and a period of rapid biomedical expansion precipitated by widespread warfare changed how biomedicine recognized and treated trauma in the early 20th century. By examining historically bounded biases originating in the relationship between self-reported injury and population-level models in neuroscientific practice, we may start to address present-day TBI healthcare demands that appear to be outstripping our current research and care models solely focused on masculine violence.

Psychiatric Encounters between Czechoslovakia and Ethiopia: Theorizing A Socialist Transcultural Psychiatry? ***Sarah Marks, Birkbeck, University of London***

In 1959, a partnership was formed between Haile Selassie's Ethiopia and Communist Czechoslovakia, to support development in medicine and science, which endured through to the end of Communism. Like many East European-African partnerships during the Cold War there was a contribution to the training of experts, the temporary posting of Czechoslovak healthcare professionals, material support for building projects, and technical assistance with medical equipment. Unusually, a Czech psychiatrist Dr Ivan Pišl was also dispatched to work at Addis Ababa's Amanuel Mental Hospital; and a large number of Ethopian students were hospitalised during their time in Prague with psychiatric symptoms, and their cases theorized by Czechoslovak doctors. This paper contextualises the encounters between Czechoslovak mental health professionals and Ethiopian patients in both Addis Ababa and in Prague. Drawing on archival and published primary sources from the Czech Republic, Ethiopia and the WHO archives, it reconstructs the scientific and medical exchanges between the two countries, the Czechoslovak psychiatric gaze in these contexts, and how the Ethiopian patient was theorized and diagnosed within a system of mental health science which was itself in flux during the Communist period. Drawing on different diagnostic categories to western psychiatry, this case study offers an alternative history to the ethnopsychiatric theories of the British colonial and post-colonial settings, and the paper will explore these differences in comparative perspective.

Project for a Cybernetic Psychology: The Freudian Origins of AI ***Won Jeon, University of California, Santa Cruz***

The paper reflects on the presuppositions and consequences of Sigmund Freud's failed neurological work Project for a Scientific Psychology (1895) in light of scientific advances in cybernetics and information theory after 1940. By proposing Freud's Project as one that had inadvertently modeled the structure of digital language, informational circuits, and neural networks almost 50 years before the work of canonical cyberneticists (Norbert Wiener, Claude Shannon, Warren McCulloch, and Walter Pitts), the paper contends with a complex disanalogy between the working machine and the thinking mind epitomized in Freud's early thinking. It further demonstrates how this disanalogy was rooted in the conceptual foundations of nineteenth-century thermodynamics and physiology and why this history of concepts was equally significant for the development of psychoanalysis and cybernetics, respectively. Freud's attempt at a neurological theory renewed in light of contemporary interest in artificial intelligence has the advantage of

accessing critical approaches inside the discourses of psychoanalysis and cybernetics, highlighting the complications generated from the (machinic and human) capacity to know, learn, and change. The paper thus argues that this historical overlap is helpful as a critical orientation within the contemporary discourse and commercialism of artificial intelligence. Freud's retroactive contributions to the cybernetic view of mind contend with anxiety surrounding the impact of machinic automation on human subjectivity, posing critical questions about the value of human thought and work (particularly in the context of education and intellectual labor) in a global world increasingly governed by "intelligent" machines.

Chair:

Frank W. Stahnisch, University of Calgary

128. Bodies of Knowledge

Contributed Paper Session

3:30 to 5:00 pm, Saturday 9 Nov.

Fiesta Americana: 1st Floor - Izamal II

Participants:

Measuring up Chinese Children across the Pacific: Vivia B. Appleton's Transnational Anthropometric Research *Shu Wan*

Since the late 19th century, anthropometry has become a prevalent tool for describing and delineating racial and gender boundaries among human beings in the United States and some European countries. Along with their peers' efforts in conducting anthropometric research on the Native Americans, the African Americans, and other racial groups, several American professional missionaries in China attempted to integrate Chinese people into the scope of anthropometric research. This presentation intends to explore how an amateur anthropologist, Vivian B. Appleton, invoked anthropometric standards and methodology in racializing Chinese at home and abroad. As an American medical missionary, Vivian B. Appleton's transnational research agenda of the distribution of Chinese and Chinese American children's anthropometric data in the Guangdong province of China and Hawaii. I have only done preliminary research on limited published materials pertaining to Appleton's anthropometric fieldwork in the two countries. Hence, I could only propose a brief and tentative organization of presentation. I plan to review Appleton's assistance with the influential American medical missionary William W. Cadbury in conducting an anthropometric survey on local students in the 1910s and 1920s in Guangzhou. Moreover, I intend to demonstrate her independent efforts in collecting anthropometric data on Chinese American children in Hawaii when she finished her service in China and joined the faculty of the University of Hawaii at Mānoa in the late 1920s. In her fieldwork, Appleton observed the higher anthropometric data of the young Chinese Hawaiian than their counterparts residing in China. Finally, the presentation will explore Appleton's comparison of the data gathered in two countries, which led her to the conclusion that environmental factors, especially the difference in nutritional variables, mainly caused the racial differences between the Chinese and Caucasians in the distribution of anthropometric data.

Paul Ekman and the Making of the Isolated Face in New Guinea, 1966-1971. *Heewon Kim, Korea Advanced Institute of Science & Technology*

This presentation examines psychologist Paul Ekman's practices of collecting facial data within the sociopolitical and intellectual landscapes in the late 1960s to the early 1970s. I explore Ekman's collaboration with anthropologist Richard Sorenson alongside the critiques from Margaret Mead and Ray Birdwhistell, who sought patterns of cultures from nonverbal behaviors. In the beginning, anthropologists appreciated Ekman's recognition of anthropological films and his publications from the New Guinea field trips in 1967. In planning his cross-cultural research, Ekman reached out to anthropologists to acquire their films of "Stone Age" cultures, including NIH researcher Carlton Gajdusek and his cinematographer Sorenson. Seeing great prospects from each other's works, Ekman came to join Gajdusek and Sorenson on their New Guinea expedition. It was soon realized that they had different ways of interpreting data, either as evidence of pan-cultural facial expressions of emotions or the cultural changes taking place in New Guinea. In the end, they each had their works published in distinct journals. Historians of science and STS scholars saw the rise of Ekman's sciences as foreshadowing how technologies today are appropriating the emotional states of human subjects. The focus of this presenation is on Ekman's meticulous data practices of dislocating the face from bodies, interactions, and cultural contexts. Sorenson, Mead, and Birdwhistell argued against the feasibility of

such isolation. The arguments in this presentation are supported by materials from published and unpublished works of Paul Ekman, Carlton Gajdusek, Richard Sorenson, Margaret Mead, and Ray Birdwhistell.

Bringing Science to Allied Health: Academic Status and Barriers to Diversity in American Physical Therapy ***Andrew J Hogan, Creighton University***

During the mid twentieth century, many US health professions followed medicine by moving their training programs into academia. Physical therapy (PT) did so in 1960, requiring that all new practitioners earn a university-based bachelor's degree. Occupational therapy (OT) and other "allied health" professions, which work closely with or under the direction of physicians, followed similar trends. Once inside the university, allied health faculty learned that their fields' and careers' longevity and status depended heavily on scientific research productivity. As historians, including Beth Linker and Dominique Tobbell, have described, this realization led clinically based professions to develop or embrace parallel fields of "movement science," "occupational science," and "nursing science." Building on this scholarship, my presentation examines the broad-ranging impacts of PT's adoption of an academic science identity. Once again following medicine, this included transitioning entry-level PT education to a clinical doctorate and choosing students based on their performance in prerequisite basic science courses. PT even went beyond medicine, requiring that at least half of core PT faculty in all training programs hold an academic doctorate (PhD, EdD, or ScD) in addition to their clinical doctorate. I argue that this unique requirement, which was meant to increase PT's research productivity and academic status, created significant barriers to recruiting faculty and students from underrepresented racial/ethnic minority backgrounds. My presentation compares PT's transition into academia with other predominantly female health professions, including OT and nursing. PT's adoption of a one-size-fits-all approach to its academic program requirements greatly narrowed who could become a PT student or faculty member. I consider the intersectional aspects of how this history has shaped PT's longstanding failure to become a more racially/ethnically diverse field.

Chair:

Sarah Elizabeth Naramore, Northwest Missouri State University

129. Chinese and Western Science in Conversation

Contributed Paper Session

3:30 to 5:00 pm, Saturday 9 Nov.

Holiday Inn: Lobby Level - Maya

Participants:

"Tokens" Remained to be the "Tokens:" Charles Lyell's Elements of Geology in China ***Xiaoxing Jin***

This paper delves into the translation of Charles Lyell's Elements of Geology within the context of China's Self-Strengthening Movement during the late nineteenth century. This movement, which prioritized practical knowledge, engaged prominent figures like Hua Hengfang and Daniel McGowan in the translation endeavor. Employing the collaborative translation method known as "Heyi," they endeavored to bridge linguistic disparities, fostering cooperation between Western and Chinese scholars. Nevertheless, the translation of scientific terminology, notably absent in Classical Chinese, presented a formidable challenge. To surmount this obstacle, McGowan and Hua ingeniously harnessed sound symbolism to craft Chinese terms that resonated with English phonetics while preserving an element of foreignness. The resultant work, Dixue Qianshi, transcended strict adherence to the source material, purposefully omitting intricate geological details to align with the Self-Strengthening Movement's emphasis on practical knowledge rather than theoretical complexities. Despite these adaptations, Dixue Qianshi emerged as an influential catalyst, propelling the study of geology within China's burgeoning academic institutions and contributing to scientific education, albeit with some deviation from the source text. This narrative of translation underscores the formidable challenges inherent in navigating linguistic and cultural disparities, illuminating the creativity intrinsic to the translation process. Ultimately, the translation of Elements of Geology into Dixue Qianshi stands as a symbol of the profound disparities in national influence and scientific expertise characterizing late nineteenth-century China and the United Kingdom, encapsulating the intricacies of translation as a vehicle for cultural exchange and adaptation, addressing linguistic, cultural, and epistemic divides between these two worlds.

Technician, Naturalist or Humanist? The European Engineering Culture in China ***Changxue Shu, University of Hong Kong***

This paper bridges the gap between engineering history and the legacy of Joseph Needham (1900-95) in the historiography of Chinese science. I argue that the Western engineering practice in modern China (1840-1949) shaped and presaged the ways Chinese science was written in the Needham tomes entitled Science and Civilisation in China (SCC, 1954-). In the SCC-3 (1959), SCC-4-3 (1971) and SCC-5-5 (1986), for instance, Needham has repeatedly referred to the pioneering writings on Chinese astronomy by engineer Herbert Chatley (1885-1955) who worked in China from 1909 to 1937, and about Chinese bridges by Danish hydraulic engineer Helge Fugl-Meyer (1894-1975) who worked in China from 1919 to 1929. Lately Prof. Catherine Jami (2024) has also demonstrated the correspondence between Chatley and Needham in the period 1948-1954. Based on these evidences, the present study investigated further into primary sources from the engineers with a focus on their professional network and China experiences in a bigger picture. The European engineers' technical experience in modern China turned out to be also a cultural and philosophical one. Through extensive fieldwork and projects such as railway, dredging and hydraulic works, they acquired a new understanding of traditional Chinese science but also added new meanings to the modern Western concept of "engineering". They criticized the writings of history of science and re-defined "science". This paper discusses the unspoken roles the engineers have played regarding the issue of reciprocal relationship between Chinese and Western knowledge. It seeks to advance the discussion on epistemological significance of engineering.

Chair:

Mengliu Cheng, University of Pennsylvania

130. Twentieth-Century Health Politics

Contributed Paper Session

3:30 to 5:00 pm, Saturday 9 Nov.

Fiesta Americana: Lobby Level - Salon Celestun

Participants:

Eugenic Standards, the Flexner Reforms, and Carnegie's Legacy in American Medical Education ***Adam Biggs, Rensselaer Polytechnic Institute***

Although frequently critiqued for its detrimental impact on Black medical education, the Flexner Report receives both too much and not enough blame for its role in cultivating exclusionary anti-Black sentiments within professional medicine. Rather than the proverbial "philosopher's stone" of educational reform—instantaneously transforming American medical education into its modern configuration—Flexner's survey was part of a larger campaign spearheaded by the Carnegie Foundation to reshape American education along eugenic standards that defined intelligence and academic merit in ways that privileged white supremacy and justified racial exclusion. Requiring medical schools to adopt more stringent admissions criteria, expand course offerings, increase the time-to-degree, upgrade laboratory facilities, provide clinical training, grow endowments, along with other stipulations, early-twentieth century reforms were designed to "weed-out" the unfit from the ranks of the professional classes. While purportedly gauging intellectual prowess, mental acuity, and practical skill, Flexner's reforms actually achieved their exclusionary goals by raising the cost of medical education, making it prohibitive to all but the white elite with disproportionate impact on African Americans, women, immigrants, and the poor. By placing the Flexner report in the context of the Carnegie Foundation's more expansive twentieth century educational reform efforts, my work illustrates how "modern" medicine and other meritorious tropes associated with early-twentieth century reforms serve as metaphors for racial exclusion, masking eugenic models of white supremacy under the guise of professional "rigor" and "better" medicine.

Public Health has Always been Political. Inclusion and Exclusion of Social Groups in the 1926 Düsseldorf Exhibition for Health Care, Social Welfare and Physical Exercise ***Matthis Krischel, Heinrich Heine University Duesseldorf, Germany***

In 1926, the largest exhibition in Germany in the inter-war period took place in Düsseldorf with 7.5 million visitors: the "GeSoLei", i.e. the "Great Exhibition for Health Care, Social Welfare and Physical Exercise [Große Ausstellung für Gesundheitspflege, soziale Fürsorge und Leibesübungen]". The exhibition was organized by a committee of local politicians, industrialists and academics headed by pediatrician and social public health specialist Arthur Schloßmann (1867-1932). Scientific director was the physician Marta

Fraenkel (1896-1976), who in 1938 had to flee to the United States because of antisemitic persecution. In my contribution, I will analyze how different social groups (children, women, Jews, people of color) were included in and excluded from the exhibition and the audience. I will relate these inclusions and exclusions to the politics of the Weimar Republic, the first democratic era in Germany, and to contemporary concepts of health and hygiene. This will contribute to a more differentiated understanding of inclusion of different social groups into Weimar-era Germany among different dimensions, such as ethnicity, gender and social class. It will also illustrate that public health and health education have always been political.

How Prevention Became Collective: The Social Origins of the Dutch Immunization Program, 1900-1960 ***Martijn van der Meer, Erasmus University Rotterdam***

In 1957, Dutch parents were granted access to free vaccinations for diphtheria, whooping cough, tetanus, and polio, a watershed moment departing from the individualized vaccination practices of general practitioners. This paper contends that the transition towards a nationally coordinated immunization program was not just a logistical shift but a conceptual overhaul, spurred by public health reformers and policymakers who sought to redefine disease prevention as a collective endeavor amidst an uncertain future. Drawing from original archival research, this talk illuminates how the pivot towards mass vaccination was rooted in the recognition of "herd immunity," a concept gaining traction in Dutch policy circles to grapple with the ramifications of declining smallpox vaccination rates. This heightened focus on population health compelled policymakers to advocate for the organized coordination of vaccination efforts. However, these endeavours faced initial pushback from some general practitioners, apprehensive about the potential loss of autonomy and patients. To secure collaboration across the medical profession, Dutch public health reformers and policymakers reframed the objective of mass vaccination as the maximization of individual immunizations—the "vaccination condition"—rather than solely prioritizing herd immunity. This shared goal galvanized local collectives of general practitioners, reformers, and civil associations to jointly undertake the practical work, with the national government bearing the costs of vaccines. As such, the paper underscores how mass vaccination in the 1950s contributed to shaping a welfare state where cooperation between the national government and local civil society organizations was quintessential in enabling public health as a collective activity.

"The Commission Cannot be in the Open: Medical Civil Rights in 1964 Mississippi" ***Alexandra Kathryn Fair, Harvard University***

Alexandra's paper examines backlash against medical civil rights activism in Mississippi. During the Freedom Summer voting rights campaign of 1964, doctors affiliated with several civil rights organizations identified poor health outcomes caused by medical racism. Segregated hospitals and widespread income inequity produced poor health outcomes and nutritional deficits disproportionally affecting Black Mississippians, mimicking the intended goals of the eugenics movement. After Freedom Summer, former volunteers worked to combat these health disparities. Local doctors, church leaders and parents decried the impact of malnutrition on Black families' health. Yet they faced steep opposition to reforms from united eugenics and segregationist organizations. I argue that these organizations colluded to fabricate statistics in state reports to federal agencies and obscured statistics documenting malnutrition. Such statistical manipulation blocked federal aid and disproportionately made Black families suffer. I contend that this manufacturing of disinformation and misappropriation of needed support further entrenched disparities in nutritional health and, in the process, constituted intentional backlash against recent civil rights gains. This effort was made possible only by financial contributions and institutional support from eugenics organizations including the Pioneer Fund. As such, the families and public health advocates seeking to combat malnutrition fought two battles: one to register medical racism before Congress and one to access aid.

Chair:

Kathryn Grace Maxson Jones, Purdue University

131. Science and its Imaginaries between the "Second" and the "Third" Worlds

"Futures" Roundtables

3:30 to 5:00 pm, Saturday 9 Nov.

Fiesta Americana: Lobby Level - Salon Mérida

Recent scholarship on the history of science, medicine, and technology in global socialist contexts has thrown light on new understandings of scientific

knowledge production and practice. Concurrently, research on postcolonial spaces and exchanges involving broader geographies has questioned established narratives of how we can understand science itself. As part of this effort to decentralize the history of global science, the investigation of socialist internationalism in science demonstrated the importance of cooperation and knowledge exchange between the so-called "second" and "third" worlds. In our roundtable will look beyond the practices of socialist internationalism and focus on the mutual perceptions of science between the "second" and "third" worlds and the ways in which they have influenced knowledge exchange. Drawing on the speakers' expertise spanning four continents, we will discuss how the underlying imaginaries and stereotypes of science were shaped at the intersection of political, social, cultural, and epistemic interests and influences. Stepping away from the binaries of North/South and East/West to viewpoints outside of the 'usual suspects' of the United States, Soviet Union, and Western Europe, this roundtable explores possible futures for the history and historiography of science with the inclusion of overlapping socialist, developing and decolonising spaces and networks. Roundtable members bring perspectives from North Africa and the Middle East, Eastern Europe, Latin America, and East Asia to the discussion, which will weave together historical and historiographical questions to explore possible trajectories in the history of science. How does the integration of imperfect pasts of state socialism and colonial relations affect the way we think about the history we are writing, the politics of scientific knowledge production and practice, global exchanges, and what we believe constitutes science? How does this approach shape conceptual underpinnings and methodological approaches in research?

Session Organizers:

Jan Jakub Surman, Masaryk Institute and Archives of the Czech Academy of Sciences
Dora Vargha, University of Exeter / Humboldt University

Participants:

Nicole Elizabeth Barnes, Duke University
Soha Bayoumi, Johns Hopkins University
Jennifer Derr, University of California, Santa Cruz
Edna Suárez-Díaz, Universidad Nacional Autónoma de México
Jan Jakub Surman, Masaryk Institute and Archives of the Czech Academy of Sciences
Dora Vargha, University of Exeter / Humboldt University

132. Knowing Watery Worlds: Uncertainties, Affect, and Emplaced Knowledge in the Twentieth Century

Organized Session
3:30 to 5:00 pm, Saturday 9 Nov.
Holiday Inn: Lobby Level - San Jacinto

Water is not a singular thing. In the natural sciences, it takes different forms by virtue of its elemental state, spatial scale, and parameters such as temperature, salinity and turbulence. In this panel, watery worlds are rendered knowable through a constellation of scientific modes of expertise, forms of political governance, and heterodox epistemologies. From prognostications of multispecies peril as told through stories of acidifying coral reefs, battles over environmental justice playing out in New York's watersheds and debates over deep oceanic processes central to climate models, water becomes the site from which to foretell planetary futures. Each of these papers explores the intersections of place and knowledge about waters. By attending to place-based knowledges, through archival and ethnographic engagements, Tathagat Bhatia, Nathan Crowe, and Anna Lehr Mueser suggest generative new methods for the history of science by demonstrating the value of historically situating affective and place-specific elements of knowledge production. Uncertainties, contested spaces, and ambiguities emerge from these papers. Thinking with and through water as an analytic, paying attention to its materialities, and the different valences it holds to different stakeholders opens up new ways to understand the role of place-based knowledge in a rapidly changing world.

Participants:

Emplacing the Deep Ocean: Data, Fieldwork and Affect in Late-Twentieth-Century Oceanography ***Tathagat Bhatia, Massachusetts Institute of Technology***

In 1966, the oceanographer Walter Munk published his paradigm-bending paper "Abyssal Recipes" that formalized the process by which troughs of cold water sank to the ocean floor, mixed with warmer waters, and rose back up. His picture of the ocean floor as a zone of uniform mixing provided the theoretical scaffold to a generation of oceanographers, even as they failed to find direct evidence of this mixing. The problem of "missing mixing," as it came to be known in the nineties, took on a new significance as climate scientists underscored the role of surface water sinking and mixing in the transfer of carbon between the atmosphere and oceans. Imperfect knowledge of deep oceanic pasts and presents was producing uncertain diagnostics of a future on a climate changed

planet. For oceanography, a discipline that had enthusiastically adopted computational models of watery flows since the mid-twentieth century, mixing was to be made sense of not virtually in the laboratory, but through novel techniques of fieldwork in the deep ocean. This emplaced fieldwork was structured by international regimes of maritime governance, imperatives of mineral extraction on the seafloor, and networks of US-European scientific expertise. This paper traces processes of knowledge-making in the deep ocean in the later twentieth and early twenty-first centuries and asks after the place of "place" or in situ fieldwork in oceanography that had increasingly begun to be practiced at a distance, behind computer screens. In doing so, it tracks how deep ocean fieldwork rendered undifferentiated abyssal space into a legible place suffused with scientific meaning and wonder for oceanographers.

New Corals in Old Reefs? Genetic Engineering, Coral Reefs, and the Pressures of Climate Change in the History of Biotechnology ***Nathan Crowe, University of North Carolina Wilmington***

In the marine realm, and particularly during a time of climate change, coral reefs occupy a particularly powerful place. The destruction of coral reefs around the world, and their viscerally visible bleaching as they disappear, is often one of the most leveraged symbols of the impact of climate change. Because of that, coral reefs have been the target of substantial conservation efforts. But the most effective ways of saving corals–widespread reduction in pollutants and carbon emissions–have not yet become established policy, some biologists have turned towards leveraging new techniques that could be used to develop coral strains that are climate resistant. Several of these new techniques involve genetic modification, either through directed evolution or genetic engineering, and have generated debate in the community as to the directions, risks, and rewards of such research. Debates regarding genetic engineering, of course, are not new. We are currently about to commemorate the 50th anniversary of the 1975 Asilomar Conference on Recombinant DNA. Yet, the genetic modification of marine life, and particularly doing so to ameliorate the effects of climate change, raises potentially new variables that have not often been a part of genetic engineering discourse. I have recently begun working with marine biologists who have developed CRISPR-based techniques to engineer corals and am applying the long-standing discussions in the history of science to help illuminate how we should think about genetic engineering in our watery worlds. These worlds, of course, are not always bounded by one nation and engage a variety of stakeholders, including scientists, conservationists, policy makers, tourism industries, and those people whose economic and caloric livelihoods rely on coral reefs surviving in the future.

Fixing Streams: Emplaced Agricultural Knowledge in Twentieth-Century Rural New York ***Anna Lehr Mueser, University of Pennsylvania***

In New York City's rural watershed, a region that spans some 1,600 square miles in the Catskill Mountains of New York, streams have presented a persistent challenge for water quality management. In this paper, I argue that farmers using tacit and place-based knowledges to manage farm streams do so through collective memories inflected by both the loss of villages and farms to reservoir construction in the mid-twentieth century and changing agricultural economics. Invoking past agricultural expertise and intergenerational place knowledge, watershed farmers naturalized early- and mid-century recommendations as local knowledge, while resisting newer forms of expertise perceived as threatening the stability of farm soil and viability. At the nexus of intersecting municipal, state, and federal environmental and public health regulations, streams flow through the watershed, linking roadsides and forests, farms and towns, mountaintops and the inundated valleys from which the city draws its water. For water quality managers in New York City, this watery network is both a source of water and a source of myriad threats, including sedimentation that can both fill in reservoirs and cloud water, and agricultural runoff that may carry both pathogens and nutrients into the water supply. A heterogenous group of knowledge producers, including farmers and water supply managers, work together across multiple epistemic models of streams and their functions, often reaching opposing conclusions about the shared problem of farm erosion. In contrast to water quality managers, who demand as little intervention as possible, farmers speak of "fixing" and "repairing" streams by preventing the movement of stream channels. As such, farmers rely on the past as

it is experienced and remembered, which suggests a stable agricultural community for the future. In a community shaped by displacement and intense regulation, these embodied pasts and imagined futures represent vital forms of knowledge.

Session Organizer:

Anna Lehr Mueser, University of Pennsylvania

Chair:

Etienne Benson, Max Planck Institute for the History of Science

133. Disputing Science

Contributed Paper Session

3:30 to 5:00 pm, Saturday 9 Nov.

Holiday Inn: Lobby Level - Santiago

Participants:

Types and Functions of Physicians' Letter-Writing in the 16th and 17th Centuries ***Michael Stolberg, University of Würzburg, Germany***

Letter writing played an outstanding role in the early modern res publica literaria medica. Before the advent of scholarly and scientific journals, letters were the principal medium through which physicians exchanged their ideas and findings about medical and natural-philosophical matters and carried out controversies. Many physicians maintained a lively correspondence also with scholars active in other fields of knowledge, such as history and numismatics, and literally thousands of them sent reports and supplications to princes and town authorities or offered epistolary counsel to patients and their relatives on individual cases. This paper will offer a typology of the various types and functions of physicians' letter-writing in the 16th and 17th centuries, based on the data on about 65,000 letters which a research group at the University of Würzburg, Germany, has studied and entered – frequently with a detailed extensive summary – into a freely accessible online-database (www.aerztebriefe.de), in a long-term project, which started in 2009 and will terminate its work in December 2024.

Whose Nature? A Scientific Property Rights Dispute in Singapore in 1820 ***Yotam Tsal, Dan David Society of Fellows, Tel Aviv University***

In 1818, two French naturalists, Pierre-Médard Diard and Alfred Duvaucel, embarked on an expedition from Paris to investigate the biodiversity of Southeast Asia and the Indian subcontinent. Undertaken in collaboration with Stamford Raffles, a British East Indian administrator, the trip culminated in their arrival in Singapore, a new British colony, in 1819. In this locale, Diard and Duvaucel engaged local artists to render visual representations of local specimens. Diard and Duvaucel also stuffed local fauna, and kept a little menagerie. When the two Frenchmen wanted to send the specimens and illustrations they helped in producing to the Parisian National Museum of Natural History, a fiery exchange erupted between them and Raffles, who claimed that the specimens and illustrations belonged in British hands. In this paper I argue that the dispute opens an aperture into the workings of inter-imperial struggles over property rights of natural resources in Southeast Asia. The question at stake was who owned the rights to display and keep stuffed specimens and illustrations of local fauna and flora? This dispute over scientific property rights sheds light on the intricate inter-imperial relationships in Southeast Asia that involved several forces–from Britain, the Netherlands, and France to local Rajahs and Sultans, and numerous local hands and minds who were involved in the production of specimens and illustrations. Although no actor explicitly made the claim for non-European rights over these representations, the dispute nevertheless brings to the fore discussions concerning indigenous rights over local nature.

"Glasses He Made Sent Dr. Rakusen into Court": A Battle over Vision Diagnosis in 1920s Global Shanghai ***Jingwen Li, Princeton University***

Key words: diagnosis, accuracy, objectivity, sensory impairment, science and media, clinical communication In the spring of 1926 in Shanghai, a British Jewish individual identifying as an "optometrist" found himself embroiled in a legal dispute brought by a dissatisfied Indian customer, who alleged negligent work in refraction examination and faulty prescription of lenses. Despite employing "objective" instruments in his measurements, the lenses prescribed by the "optometrist" were found to result in "dizziness", "eyestrain", and "pain". This widely publicized "eyesight case" sparked a debate in Shanghai on what was an "accurate" diagnosis, and whose judgments should hold precedence. This paper utilizes this case in Shanghai as a lens to examine the competing perspectives from medical and optical professions, technologies, patients/customers, merchants and legal authorities in negotiating a legitimate diagnosis. The case provides valuable insights into the transnational exchange of labor, expertise, and

values in the 1920s between China, the US, and the British Empire. Despite efforts to achieve objectivity through scientific instruments, the case reveals that this pursuit did not always result in "suitable" prescriptions in real clinical and commercial encounters. Beyond this specific case, it underscores the inherent challenge in capturing human visual experience, necessitating a continuous mediation between the examiner, the examinee, and the instruments employed.

L'enfant terrible of Bar Harbor: Richard Lewontin at the 1968 Bar Harbor Short Course and the Fate of Medical Genetics ***Caroline Susannah Wechsler, University of Pennsylvania***

Victor McKusick's Short Course in Medical Genetics at Bar Harbor, ME, represents a touchstone in the institutionalization of medical genetics. Begun in 1960 and still held every summer, the Bar Harbor Short Course promotes the medical potential of genetic expertise. In 1968, iconoclastic population geneticist Richard Lewontin visited the course to offer a summation speech, in which he lambasted the priorities and values of medical genetics, in addition to personally insulting McKusick and his co-founder. In the aftermath, reporting on the speech in the lay press infuriated McKusick and his colleagues, and appeared to threaten the standing of the field of medical genetics they had worked hard to ensure. In this paper, I explore the 1968 Bar Harbor short course as a key window onto the transformation of medical genetics from a scientific backwater into a promising and central research frontier in the late 1960s. Drawing on a range of archival sources, including McKusick's papers at the Alan Mason Chesney Archives at Johns Hopkins University and Lewontin and others' papers at the American Philosophical Society, I argue that the 1968 controversy demonstrates the precarious position of medical genetics in the 1960s, far from becoming central to medicine and science. The speech and its aftermath make visible the extensive strategy and effort that McKusick and others engaged in to make medical genetics' eventual rise to clinical and scientific relevance appear inevitable.

Chair:

Samantha Muka, Stevens Institute of Technology

134. Sites of Knowledge: Spatiality, Territoriality, and Environment in Latin American Archaeology

Organized Session

3:30 to 5:00 pm, Saturday 9 Nov.

Fiesta Americana: Lobby Level - Yucatan I

This panel explores the multiple sites within which archaeological knowledge was constructed across Latin America: from international scholarly conferences to the urban and agrarian landscapes surrounding the archaeological monuments themselves. As a scientific practice rooted in an engagement with the earth and the subsoil, this panel foregrounds the ideas of space, territory, and environment in our understanding of the history of archaeology. Contributors examine the construction of "sites of knowledge" in the context of extractivist business interests, large-scale agricultural programs, academic institutions, and the politics of Indigeneity and heritage. The panel seeks to trace the roots of archaeological practice and thought to key locations and historical actors, from workers at a field site to transnational networks of scholars spanning the globe.

Participants:

Scientific Congresses as Network Makers: History of the International Congress of Americanists and Its Long-Term Consequences ***Lorena López Jáuregui***

This conference paper examines the history of one of the longest-running congresses in existence. Since its first meeting in 1875 in Nancy, the International Congress of Americanists (ICA) has exhibited trends in scientific communities' formation and adaptation to changing contexts. Its members undertook large-scale interdisciplinary research on the indigenous populations of the Americas during the professionalization of archaeology and anthropology and the formation of science museums in Europe and the Americas. Therefore, by following the Americanists and their meetings, expeditions, excavations and science museums, the author proposes to rethink the scope of its theoretical, methodological and social contributions across national and disciplinary borders. She will discuss how the contemporary concept of cultural heritage was a consequence of their international network.

Revolutionary Reforms: Archaeological and Agrarian Struggles in Mexico, 1917-1948 ***Andrés Bustamante, Yale University***

In the aftermath of the Revolution of 1910, Mexico codified its nationalization of the subsoil in Article 27 of the 1917 Constitution. The article's radical contents granted the

government the authority to reshape property rights in the public interest in an attempt to remake the unequal relations of access to land and resources that had catalyzed the conflict. Article 27 embraced an expansive vision of the "subsoil"— one that encompassed not only land, water, minerals, and oil, but also, notably, archaeological monuments and artifacts. This paper examines how archaeological excavations shaped the interpretation and implementation of Article 27, thereby transforming a landscape in flux. The constitution granted the government vast powers to manage land and subsoil resources, but it also produced unexpected crises when multiple state-sponsored land use projects—in this case archaeology and agrarian reform—overlapped on the same landscape. This project explores how these territorial entanglements generated new forms of scientific governance, systems of land tenure, and models of economic development.

Environment and Heritage at the Archaeological Field Site: Guatemala, c.1920-1944 ***Sophie Brockmann, University College London***

This paper argues that the process of creating heritage sites from archaeological field sites was rooted in archaeologists' relationship with tropical environments, extractive industries and large-scale agricultural business. Emblematic Maya archaeological field sites in Guatemala were often located in landscapes under active human management. This meant that the interpretation of sites, including their emerging construction as national heritage, and debates about the conservation of objects were tied up with the practicalities of large-scale agriculture and extractivism, as Guatemalan and North American scholars, rural laborers, and foreign business representatives presented competing visions for these spaces. Examining case studies such as Quiriguá (located within a United Fruit Company banana plantation), and using primary sources from archives in the US and Guatemala, the paper argues that environmental and agricultural factors were instrumental in establishing such sites as part of the Guatemalan national imaginary.

Selva y Civilización: Los Imaginarios Sobre lo Olmeca en las Revistas, el Arte y la Arqueología en las Décadas de 1940 y 1950 (Presentado en español) ***Haydeé López Hernández, Instituto Nacional de Antropología e Historia***

En la definición de la cultura arqueológica olmeca, como origen civilizatorio (cultura madre) en la costa del Golfo de México, se encuentran parte de las inquietudes de la comunidad académica en torno al origen de la agricultura como motor de la civilización, pero también sobre el ambiente idóneo para el desarrollo de este proceso evolutivo (¿ambientes semidesérticos y estresantes?, ¿ambientes selváticos que facilitan la innovación tecnológica?). En términos más amplios, la asociación entre la selva y la civilización implica, además, cierta reinterpretación de la asociación de largo cuño entre la primera y el salvajismo-primitivismo. En este trabajo exploraré tres espacios que pusieron en juego tales inquietudes en las décadas de 1940 y 1950: las discusiones arqueológicas; los artículos de difusión publicados en el National Geographic; y la propuesta museográfica de Carlos Pellicer en el Parque-Museo La Venta. Con ello trataré de mostrar parte de los imaginarios que, pese a no derivar exclusivamente de la disciplina arqueológica, alimentan la construcción del pasado prehispánico, así como la forma en que éste último deriva, y nutre al mismo tiempo, la noción sobre el ambiente.

Session Organizer:
Andrés Bustamante, Yale University

Chair:
Sophie Brockmann, University College London

Commentator:
Christopher Heaney, Pennsylvania State University

135. Moving Away from the Scientific Revolution? Where the Debate Stands Today

Roundtable
3:30 to 5:00 pm, Saturday 9 Nov.
Fiesta Americana: Lobby Level - Yucatan II

A ghost in the machine, the Scientific Revolution has moved off center stage historiographically but continues to structure courses in early modern science, and to be casually and ubiquitously used. Today, many departments across North America have some variation of a course on the "Scientific Revolution" in the catalogue, or have such a unit folded into their overarching survey of the history of science. Many can still quote Steven Shapin's opening sentence from his 1996 synthesis: "There was no such thing as the Scientific Revolution, and this is a book about it." While the sharply articulated mid-twentieth-century narrative is no longer accepted, an uneasy compromise has emerged that tacitly acknowledges that important changes did take place in the practice and epistemology of investigating the

natural world that was foundational to the emergence of modern science. Where do we go from here? Some scholars avoid using the term altogether, preferring to focus on the invention of science as a socio-cultural practice instead. Others have critiqued the focus on European experimentalism rather than the role of experience, including artisanal, in making knowledge. Still others have contended that much slower and dispersed changes would be better termed 'scientific evolution' than revolution. Finally, how does the growing scholarship on investigations of nature and differing epistemologies and ontologies in all parts of the early modern world change the story? Shall we move on from thinking with the scientific revolution as a necessary teaching or historiographical concept? This panel is sponsored by the Early Sciences Forum.

Session Organizer:

Patrícia Martins Marcos, University of California, Los Angeles

Chair:

Pamela H. Smith, Columbia University

Participants:

Mackenzie Anne Cooley, Hamilton College
Pablo F. Gómez, University of Wisconsin–Madison
Hannah Marcus, Harvard University
Vera Keller, University of Oregon

136. Transnational and Global Science

Contributed Paper Session
3:30 to 5:00 pm, Saturday 9 Nov.
Fiesta Americana: Lobby Level - Yucatan III

Participants:

Monetizing Morphos: Eugène Le Moult and the Global Butterfly Trade, c. 1900-1967 ***Brian W. Ogilvie, University of Massachusetts, Amherst***

What brings together Lord Walter Rothschild, the absurdist playwright Arthur Adamov, Tintin magazine, Emperor Hirohito, a Breton naturalist named Eugène Le Moult, and the penal colony in French Guiana? Butterfly collecting, and in particular, the spectacular, iridescent-winged Morpho genus. This paper examines how Le Moult built up a business importing exotic butterflies from South America to Europe. His clients included Lord Rothschild, Hirohito, Vladimir Nabokov, and other well known collectors. At his height, he had three shops in Paris. Toward the end of his life, he produced a memoir, My Butterfly Hunts, which was ghostwritten by Adamov, and a 1956 issue of Tintin featured a 4-page comic based on his career. Le Moult is a fascinating and problematic figure: he employed convict labor, he was associated with the far right Action française movement, and he was the basis for Adamov's grasping merchant Paolo Paoli. His life is a microcosm of the international trade in natural specimens that was conducted openly into the 1970s and has since become a clandestine, often illegal business.

Leveraging Uncertainty: The Development of Ballast Water Management and Marine Bioinvasion Science in the US and Australia ***Adam Sundberg, Creighton University***

During the late 1980s, a series of dramatic species introductions galvanized public attention and catapulted the nascent science of marine bioinvasion into global policy relevance. Most introductions arrived via ballast water in transoceanic vessels, which motivated a small group of marine and fisheries scientists in the US and Australia to call for regulation of this transfer pathway. The US and Australia were then coping with two ballast-mediated crises, the arrival of toxic dinoflagellates in Tasmania and Zebra Mussels in the Laurentian Great Lakes. In the process, they addressed considerable uncertainties and, in some cases, ignorance about the scope of the problem, the efficacy of proposed solutions, and the nature of impacts in marine and aquatic systems. Scholars have long noted the dampening effect of scientific uncertainty on environmental policymaking. Far from derailing policymaking, scientists leveraged uncertainties to advocate rapid changes in ballast water management. This paper examines the role of uncertainty in the early development of ballast water management in Australia and US. Although the role of scientists differed in the US and Australia, they shared important commonalities. These included their embrace of scientific uncertainty to broaden the constituencies of impact, amplify potential risks, and narrow the range of viable management strategies. It was also a powerful argument in favor of state investment in marine invasion science. Ignorance and uncertainty, thus, performed a "social function", the study of which was recently advocated by Uekötter and Lübken (2014). Although the different economic, political, and environmental contexts of these bioinvasion crises would direct US and Australian policy along diverging trajectories by the late 1990s, this early, shared approach to scientific uncertainty stimulated the further growth of marine bioinvasion science and lay the groundwork for the first international ballast water agreements.

Globalizing Early 20th-Century Russian Addiction Science ***Pavel Vasilyev, HSE University***

In the Russian context, the first decades of the 20th century witnessed both the emergence of substance abuse as a social problem and the establishment of addiction science (narkologiia) as a specialized medical discipline. This development mirrored global trends in the West and elsewhere (cf., e.g., Pliley, Kramm, and Fischer-Tiné 2016) - despite the authoritarian character of the late Russian Empire and the international isolation of the early Soviet state. The paper inquires into this puzzling similarity and aims to uncover international contacts, transfers, circulations, and entanglements of people, ideas, and practices in early 20th-century narkologiia. In doing so, I pay special attention to the German-Russian connection and the tradition of 'doing medicine together' (Solomon, 2006; Kirik & Ratmanov 2020). At the same time, following Pavel Ratmanov (2020; 2021), I am interested not only in the spread of Western ideas in modernizing 'semi-periphery' but also in the reception of Russian addiction science in Germany and beyond. For example, early Soviet public health campaigns against drug abuse were greeted enthusiastically by many Weimar physicians as blueprints for future change in their own country. I further seek to globalize narkologiia by showing its engagements with and borrowings from indigenous medical and spiritual traditions in the Russian Empire and the Soviet Union, focusing particularly on the Volga Region, the Russian Far East, and Central Asia. I highlight that the paths of knowledge circulation within the country were often complex and laden with inequality, discrimination, and cultural appropriation.

Particle Physics on Safari: Mining and the Birth of Neutrino Astronomy in Apartheid South Africa ***Julia Harriet Menzel, Massachusetts Institute of Technology***

Today, many of the largest and most significant physics experiments are conducted far outside of traditional laboratory settings: in deep underground mines, under polar ice caps, and on the ocean floor. Distinguished by their genuinely global scope, their exotic placement, and their unusual political economy, these experiments fit uneasily within familiar histories of twentieth-century physics, which as a rule center state-funded laboratories in North American and Western European metropoles. This talk asks how the history of experiment might look different when viewed from the field and from the Global South—specifically, from the bottom of a South African gold mine at the height of apartheid. It tells the story of the first large-scale subterranean physics experiment, a collaboration between the Case Institute of Technology and the University of the Witwatersrand that operated for nearly a decade (1962-1971) in the East Rand Proprietary Mine, a gold mine near Johannesburg that was for many years the deepest mine in the world. Sited over two miles underground in a tunnel nicknamed "Wit's End," the Case-Wits experiment claimed the world's first successful detection of a "wild" neutrino and furnished a model for later underground and underwater physics projects. Based on the project's extensive archival record, including a remarkable and disturbing series of photographs, this talk reconstructs the worldwide search for a mine that ended in South Africa, the texture of experimental work in the extreme environment of the mine, and the muscular culture of physics "fieldwork." In particular, the talk scrutinizes the Case-Wits experiment's relationship to South African apartheid: its direct exploitation of African migrant miners, its leadership's integration into the all-white social world of South African mining authorities, and its promise to bring "universal accolade," through scientific acclaim, to the apartheid regime.

Chair:

Dorathea Applebaum Licht, MIT

137. Nuclear History and Tense Futures: Radiation Protection and Internationalist Science

Roundtable

3:30 to 5:00 pm, Saturday 9 Nov.

Fiesta Americana: Lobby Level - Yucatan IV

In March 2011, an earthquake and tsunami caused the catastrophic failure of a civilian nuclear plant in Fukushima, Japan, producing a disaster of human exposure and environmental contamination for which the Tokyo Electric Power Company and government regulators were unprepared. Eleven years later, invading Russian forces assaulted the Zaporizhzhia nuclear power plant in Ukraine, jeopardizing its safety and raising fears that it could become a dangerous pawn in the ongoing war. As these events indicate, we have entered a new era of global nuclear risk, one which corrodes the traditional distinction between military and civilian applications. Historians of science and technology have much to contribute to these

discussions, having worked for decades to understand how scientists, physicians, military leaders, government officials, international bodies, and exposed individuals have attempted to understand, manage, and remediate the hazards of nuclear materials and technologies. This panel brings together scholars who are examining the imperfect pasts of technical knowledge systems, and who implicitly engage the tense futures of nuclear risk today. Working on several national and international contexts during the past century, our panelists will address the dilemmas, compromises, and contradictions that characterize nuclear systems and radiation protection.

Session Organizers:
Angela Creager, Princeton University
Maria Rentetzi

Chair:
Angela Creager, Princeton University

Participants:
John Krige, Georgia Institute of Technology
Soraya de Chadarevian, University of California, Los Angeles
Gisela Mateos, Universidad Nacional Autónoma de México
Per Högselius, KTH Royal Institute of Technology
Susan Lindee, University of Pennsylvania
Maria Rentetzi

138. Elizabeth Paris Event
Sponsored Session
5:00 to 7:00 pm, Saturday 9 Nov.
Museo de la Luz Mérida: Museo de la Luz Mérida

139. HSS Prize Ceremony & Sarton Medalist Q&A
Plenary Session
5:30 to 7:00 pm, Saturday 9 Nov.
Fiesta Americana: Lobby Level - Yucatan I

Presenter:
Soraya de Chadarevian, University of California, Los Angeles

Chair:
Evelynn Hammonds, Harvard University

140. Centennial Pub Quiz
Sponsored Session
7:00 to 9:00 pm, Saturday 9 Nov.
Fiesta Americana: Lobby Level - Salon Celestun

A lot can happen over the course of a century. Join Ben Gross and Kate Sheppard for a trivia competition celebrating the 100th anniversary of the History of Science Society. Form a team, outwit your colleagues, and win fabulous prizes!

Chairs:
Kathleen Sheppard, Missouri University of Science and Technology
Benjamin Gross, Linda Hall Library

141. HSS Graduate Student and Early Career Mixer
Reception
7:00 to 9:00 pm, Saturday 9 Nov.
Fiesta Americana: Lobby Level - Stelaris Bar

Session Organizers:
Iris Clever, University of Chicago
Claire Ann Votava, University of California, Los Angeles

SUNDAY, NOVEMBER, 10

142. HSS Business Meeting

Business Meeting
7:00 to 7:55 am, Sunday 10 Nov.
Fiesta Americana: Lobby Level - Yucatan I
Chair:
Evelynn Hammonds, Harvard University
Participants:
Soraya de Chadarevian, University of California, Los Angeles
Gwen Kay, SUNY Oswego
Matthew Shindell, Smithsonian National Air and Space Museum
Alisha Rankin, Tufts University
Elise K Burton, University of Toronto
Projit Bihari Mukharji, Ashoka University

143. Diversions of Difference: Racial Science after World War II

Organized Session
8:00 to 9:30 am, Sunday 10 Nov.
Fiesta Americana: 1st Floor - Izamal I

Historians of biology and the human sciences have challenged the notion that scientific racism "retreated" after World War II. Rather, it was transformed in the hands of avowedly anti-racist researchers and a new generation of hereditarian skeptics of redistributive social programs, particularly in the United States. This panel investigates various facets of this transformation. Emily Merchant considers how the UNESCO Statements on Race unsuccessfully attempted to defuse popular scientific racism with a biological definition of race that has become embedded in twenty-first century genome-wide association studies. Ayah Nuriddin follows Black intellectuals and scientists who continued the biological study of race after World War II in an effort to undermine racism, focusing on the work of Howard University physical anthropologist and physician William Montague Cobb. Michael McGovern looks at efforts by psychologists to tame bias in psychological testing, and how backlash over the applications of "differential validity" in employment discrimination lawsuits emboldened hereditarian critics while weakening legal protections. Finally, Jon Phillips examines efforts on the part of the American Eugenics Society to purge scientific racism from the eugenic project in the wake of the Second World War, focusing on anti-racist scientists recruited by Frederick Osborn for that purpose . Together, we argue that These various agendas were "diversions" of difference in both senses of the word: redirections of projects rooted in oppression toward racial justice as well as distractions that channeled resources away from redressing social inequality toward research on genetic causation.

Participants:

Finding Twentieth-Century Genetic Racism in Twenty-First Century Genome-Wide Association Studies *Emily Klancher Merchant, University of California, Davis*

The twentieth century saw the rise of a new form of scientific racism, one that defined socially identified racial categories as biological populations—reproductively isolated groups that differed from one another in the frequency of one or more genes or alleles—and attributed various forms of racial inequality to differences in gene and allele frequencies. The proposed paper traces this genetic racism from its origins in the early-twentieth-century fusion of eugenics and race science; through the 1950 and 1951 UNESCO Statements on Race, which (unsuccessfully) attempted to stabilize a biological definition of race as a means of defusing popular and scientific racism; to its embedding in the genome-wide association studies of the beginning of the twenty-first century, resulting in the nearly exclusive focus of molecular genomics on white-identified people. It argues that genetic racism advanced an incorrect but difficult to disprove (for technical reasons) hypothesis regarding the existence and nature of biological differences between socially identified racial groups that allowed for the proliferation of research agendas that diverted public resources and popular attention from the remediation of social inequities that have material consequences toward chasing likely nonexistent biological causes of health and socioeconomic disparities between racially defined groups, serving to both reinforce and naturalize these disparities.

Black Racial Science After WWII *Ayah Nuriddin*

For much of the first half of the twentieth century, Black physicians, social scientists, and natural scientists were invested in using the ideas and tools of eugenics and racial science to make claims about racial equality. 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. After WWII, Black intellectuals continued the biological study of race to undermine the premise of racism. This paper will focus heavily on the work of Howard

University physical anthropologist and physician William Montague Cobb, and examining how his work reflected an ongoing interest in studying of the biology of race. Cobb was trained as a physician, anatomist, and physical anthropologist who used anatomy and anthropometry to examine what he considered to be the true nature of racial difference. For much of his prolific career, he asserted that such study what is central to combating racism. This paper will also touch on the work of black geneticists in the mid-twentieth century who sought to use human genetics to understand the relationship between race, heredity, and disease. By looking at Black scholarship and activism in both physical anthropology and genetics, this paper will show that Black racial science continued to be important to black intellectual production well after WWII as part of multifaceted struggles for racial justice.

Psychometrics, Race, and the Arc of U.S. Civil Rights Law ***Michael McGovern, Yale Law School***

The rise of psychological testing during the twentieth century decisively shaped social and economic citizenship along with the very language we use to describe fairness. Beginning in the 1950s, testing experts developed the concept of 'validity' to assess how well tests measured what they purported to. After the 1964 Civil Rights Act prompted an expansion of tests in employment screening, experts and lawyers seized on the idea of differential validity to promote best practices: before adopting a test, a company needed to assess how it predicted success for different populations. This talk explores the origins of differential validity and how it became accepted—and ultimately attenuated—as legal evidence in anti-discrimination lawsuits. As critiques of "quotas" and government overreach dovetailed with hereditarian discourse coupling genetics and intelligence, the legal remedy for test discrimination became narrower. Proponents hoped differential validity could help de-naturalize dominant assumptions about merit, but I show that it instead helped re-entrench debates over race while leaving unexamined questions about workplace discrimination and measures of success.

Reforming Eugenics: Anti-racist Science and the American Eugenics Society After World War II ***Jon Phillips, American Institute of Physics***

In the wake of the Second World War and the revelation of Nazi atrocities, both popular and scientific support for eugenics in the United States collapsed. Even Frederick Osborn, the President of the American Eugenics Society, recognized that the scientific racism that underlay much of eugenic research and policy was untenable and that the field needed reform. To that end, Osborn invited anti-racist, and even anti-eugenic scientists to serve on the board of directors for the Society, including Theodosius Dobzhansky, Richard Lewontin, and Bruce Wallace. This paper will examine efforts by Osborn and these scientists' efforts to reform the AES and purge scientific racism from eugenics over the 1950s and 1960s, tracing them back to Osborn's work (and collaboration with Dobzhansky) during World War II countering Nazi propaganda as Chief of the Morale Branch of the Department of War., andIt will also following their efforts to salvage something of the eugenic project in the context of the broader reckoning with race science exemplified by the UNESCO Statements on Race.

Session Organizer:

Jon Phillips, American Institute of Physics

Chair:

Nayanika Ghosh, Harvard University

144. On Fieldwork. Commodity Frontiers, Labor Regimes, and Scientific Objects in Latin America, 19th-20th Centuries

Organized Session

8:00 to 9:30 am, Sunday 10 Nov.

Fiesta Americana: 1st Floor - Izamal II

From archaeology to palaeontology, mineralogy and botany, fieldwork has long provided the material basis for many cabinets and scientific disciplines. Challenging romanticized visions of the lone discoverer prospecting the field, the extraction and collection of data and of objects were densely social and economic endeavours, heavily reliant on the mobilisation of local labour, know-how, and capital, and on the deployment of local infrastructures of extraction and transportation. This panel aims to explore the intersection between economic ventures and scientific pursuits, as they shaped collecting practices and fieldwork in the nineteenth and twentieth-century Latin America. Specifically, it asks questions about the social and commercial underpinnings of the field as a scientific category; the participation of local agents (such as merchants and corporate representatives) in the extraction, classification, and exchange of collectibles, and in the definition of their market values; the insertion of a local labour force in the highly asymmetrical market for scientific objects. Focusing on planters and farmers,

corporate agents and day laborers, the papers in this panel further push against the seemingly unambiguous dividing lines between scientific objects and commodities as well as between the professional and the amateur.

Participants:

From the Río de la Plata to Barcelona. José Salvador's Fellow Countrymen as Agents of Barcelona's Natural History Collections, 1830-1855 ***José Pardo-Tomás, IMF-CSIC***

The collecting activity and the practice of natural history during six generations of the Salvador family, which began in an apothecary's shop in the centre of Barcelona at the beginning of the 17th century, ended with José Salvador y Soler (1804-1855), an agricultural entrepreneur who embarked on various agronomic enterprises and continued the collecting tradition of his ancestors. Among the range of activities carried out by Salvador to publicise and consolidate his horticultural business, we will focus on his relationship with the Academy of Sciences and Arts of Barcelona, since through it we can learn about a group of Salvador's Catalan "countrymen" who crossed the Atlantic to the lands of the River Plate, although sometimes only glimpsed due to the fragmentary documentation. Dedicated to very diverse activities, however, they collected and sent objects, specimens and samples of American nature that went on to swell the collections of the Salvador family, as well as those of the Academy of Sciences of Barcelona.

Peor-es-nada. Extracting the Mayan Material Culture in Nineteenth-Century Guatemala ***Christian Stenz, University of Heidelberg***

In 1876, the German plantation owner Carl Hermann Berendt asked the agrimensor Herman Au to survey a stretch of land called Peor-es-nada in order to obtain a land title from the Department of Escuintla in western Guatemala. Such an approach seems hardly unusual in the context of an expanding plantation economy that transformed western Guatemala from the 1850s onwards. In this case, however, Berendt had no intention of planting crops, but instead began excavating and removing the extensive Mayan material culture in the area. Taking the fieldwork and collecting practices of planters in the department of Escuintla as a case study, this paper further investigates the intersections between scientific and economic practices. Then, beyond the acquisition of a land title, Berendt was constantly looking for financial resources, ordered instruments, tried to connect the excavation site to the existing infrastructure and had to recruit labourers. In this way, economic practices and rationales were inextricably linked to and shaped the often highly unequal power relations in the production and circulation of scientific knowledge. Thereby, this paper does not argue for an all-encompassing commodification but rather to take serious the social and economic context in which fieldwork and collecting practices were embedded.

The Labor Force of the Department of Prehispanic Monuments and the Production of Scientific Knowledge in Mexican Anthropology, 1885-1972 ***Sam Holley-Kline, University of Maryland, College Park***

While the historiography of Mexican archaeology tends to emphasize the role of the state in the development of the discipline, recent studies in both the history of science and archaeology seek to understand the participation of workers in facilitating the practices of science in the field. Among other actors, the custodians and caretakers of archaeological sites deserve more attention. They served as agents of the state before communities near archaeological sites, but also as interlocutors for anthropologists, archaeologists, and other scientists. As a result, they participated in the production of scientific knowledge through the maintenance of archaeological sites, the recording of finds and participation in ethnographic research. In this paper, I propose a first approach to the history of these workers, especially those who were assigned to the office in charge of safeguarding the pre-Hispanic past between 1885 and 1972. After describing the basic characteristics of the labor force over time and its dispersion throughout the country, I briefly present some case studies that link the guardians with the production of scientific knowledge. Thus, understanding custodians offers a novel perspective on the history of Mexican archaeology as it unfolds in regional political, economic, and social contexts.

Constituting the Volcano: P'urhepecha Collaborators and the Production of Geological Knowledge on the Parícutin ***Sandra Rozental, El Colegio de Mexico***

In February 1943, the ground in Michoacan, Mexico, shook and rumbled; within hours, what had once been a plateau of cornfields and

small Indigenous settlements, became a hundred-foot high volcano, spitting fire, ash, and toxic gasses into the air. The emergence of the Parícutin changed the course of the Earth sciences, especially of geology. For the first time in human history, scientists equipped with various technologies were able to witness, as well as record first hand, the birth and life of a volcano. Along with artists, photographers and tourists, geologists flocked to the area and transformed it into a site for scientific experimentation, multidisciplinary fieldwork and data collection. For this, they relied on and trained P'urhepecha collaborators, especially Celedonio González, who lived with, documented and reported on the volcanic eruptions using written letters and logbooks, maps, drawings, and photographs, during the almost ten years in which it remained active. The centrality of these collaborators' experiences, observations and forms of inscription are visible in the geologists´ archives stored in the institutions that deployed them. In this paper, I analyze the ways in which the dialogue between scientists and their local collaborators transformed how the volcano was constituted as an object of scientific knowledge. At the same time, I use ethnography to track how these actors' work and the knowledge they helped to produce lingers, circulates and is currently understood and used in the communities from which they came.

Session Organizer:
Miruna Achim, Universidad Autónoma Metropolitana - Cuajimalpa

Chair:
Miruna Achim, Universidad Autónoma Metropolitana - Cuajimalpa

145. Urgent Histories and Activism

Contributed Paper Session
8:00 to 9:30 am, Sunday 10 Nov.
Fiesta Americana: Lobby Level - Salon Celestun

Participants:

Bringing Bodies "Home": Networks of Science and Medicine and the Circulation of Bodies ***Trevor M Engel, Vanderbilt University***

I explore the global networks through which bodies traveled/were trafficked in the nineteenth century. My aim is to decenter Eurocentric views. Instead, I emphasize a global history that is truly global in its perspective of knowledge production. By focusing on the local circumstances through which people became bodies in museums, my goal is to bring to the fore the knowledge and labor produced by these bodies: not just extractive calculations by Western colonial scientists and physicians. Considering the skull of an enslaved person from Benin, West Africa, for example: the skull made its way to Boston after the person died in the Malê Uprising in Bahia, Brazil. Not only does this reveal the unique political circumstances that led to that skull's collection, but also the scientific knowledge created using that skull. Bringing narratives of medicine and anthropology together, I explore how these collections contributed to these systems of racial classification, othering, objectification, and the 'superiority' of 'scientific' knowledge. Examining the bodies through transinstitutionalization—people incarcerated in punitive institutions and forced to move between them—makes it clear the various ways that bodies have come to exist in museum collections: anatomical, pathological, anthropological, and otherwise. By extending transinstitutionalization to dead bodies, my dissertation shows how these institutions contributed to control over specific types of bodies by policing them in life and claiming ownership of them in death. I can scrutinize the different stages of loss and removal that these bodies went through before reaching their potentially final destinations, usually bereft of any identifying characteristics of who they were in life. I draw on archival material gathered from the Boston Society for Medical Improvement, Warren Anatomical Museum, Mütter Museum, and the collections of Alexander Ecker, Hermann Welcker, Johann Blumenbach, and Samuel Morton.

The Social-Justice Case for Spreading the Word about the Historical Contingency of Genetic Knowledge ***Gregory Radick, University of Leeds***

In 2022, the Journal of the American Medical Association published a "framework for promoting diversity, equity, and inclusion in genetics and genomics research." From start to finish the document exclusively concerns DNA: how to ensure that it comes from the widest range of populations; how to manage relationships with those populations so that the largest number of people participate; and how to maximize health benefits of the research for those populations. In this talk I'll first outline the case for a much more expansive conception of what a framework with that stated aim should address, emphasizing the importance of putting environments — inside

and outside of bodies — centerstage, along with the modifiability of characters which depend as much on those environments as on a given stretch of DNA. I'll then turn to consider how new histories of genetics, if incorporated into standard genetics education in place of the usual "royal road from the Mendelian revolution to the molecular revolution to the genomics revolution" picture, can help both researchers and the rest of us take environments and modifiability far more seriously. I'll illustrate with a look at how the recent historiography has cast each of those "revolutions" in a new light by emphasizing the role of historical contingency in keeping environments and modifiability at the margins of genetic knowledge. I'll end with a call for historians of science to play their part not merely in producing such histories but in spreading the word about them.

Crafting a History for Climate Science: How the Keeling Curve Became a Discovery ***Madison Renner, Harvard University***

This paper presents a new history of the "Keeling curve," a widely distributed graphical representation of rising atmospheric carbon dioxide in Hawai'i and a celebrated icon of global change. Much existing historiography credits Keeling's curve with bringing scientific and public attention to greenhouse warming beginning in 1960, when the chemist Charles Keeling published the shocking "discovery" of accumulating atmospheric CO2. I argue instead that the Keeling curve emerged during the 1980s—first as a phrase, then an index, and finally an icon—and was a product of scientific and social developments it is now believed to have caused. In the 1970s, Keeling gained renown for his commitment to careful calibration, ensuring consistency and precision in "routine monitoring"; by 1980, associates were using his name casually to refer to the rising CO2 trend. A key semantic shift occurred when diverse mentions and depictions of "Keeling's observations" were consolidated conceptually as "the Keeling curve"—a singular notional object, initially independent of any display, which scientists began to uphold as both license and explanation for climate concern. By the mid-1980s, "monitoring" had become the watchword for opposing near-term action on the carbon dioxide situation via government intervention in the economy, as the US Department of Energy and National Academy of Sciences insisted more research was necessary. It was a journalist aiming to convey scientific certainty and inspire political action who first attributed Keeling's curve to an epochal "discovery." I trace the curve's newfound standing as a trigger for postwar climate concern from his 1990 popular book into turn-of-the-century historiography, scientists' (revised) autobiographies, commemorative activities, and other cultural forms. To conclude I consider implications for understanding inadvertent innovation, iconicity, climate-science historiography, and the politics of discovery.

Time is a Resource—How Should we Spend it? On History, Climate, and Activism ***Sarah Dry***

In this paper, I consider the distinct ways that historians of science, scientists, activists and others have put time to use with respect to climate. By time, I mean a variety of temporal concepts, including deep time, dynamic time, working time, chronological (or timeline) time, and the related notions of reparation and of crisis or emergency. I also refer, more generally, to how the practice of doing history has been figured or approached by these different groups, that is, what history consists in and is used for. A focus on time as a resource reminds us that historians are not the sole, or even primary or most effective, practitioners of history. The case of climate science brings into especially sharp focus the potency of the methods and authority of history outside of history—both in scientific disciplines and in the public sphere, including that claimed by (necessarily) self-professed activists. Climate science is a science with highly distinctive and authoritative methods of deploying the past (and, relatedly, the future) as a resource. The irony that historians today strive to demonstrate impact and relevance while others, including but not limited to climate scientists, wield historical methods and/or the past to great effect should attract our attention and curiosity. I suggest that a history of activism with respect to climate must start by revealing the assumptions that determine how, when, and by whom historical methods and temporal modes are rendered powerful and, by extension, who gets to make use of them. This paper is a contribution to such an understanding using the case of climate.

Chair:

Christopher Sellers, Stony Brook University

146. Piscine Mice: The Ascendency of Fish and Other Aquatic Animal Models in the Research Laboratory

Organized Session

8:00 to 9:30 am, Sunday 10 Nov.

Fiesta Americana: Lobby Level - Salon Mérida

Complex aquatic animals have become increasingly important to postwar biology as model organisms in fields such as genetics, neuroscience, and ethology. In fact, certain fish have become so common in laboratories that researchers regard them as “piscine mice.” The contributors to this session will consider recent life-sciences research on four species while confronting two broader questions: what features of modern biology (and modern society) have made fish (teleosts) and cephalopods attractive research subjects, and in what ways have these creatures challenged the notion of the model organism? Alistair Sponsel discusses the unintended emergence of the Siamese fighting fish Betta splendens as an experimental model in schizophrenia research during the 1950s. Fabio De Sio’s study of Octopus vulgaris as a model of learning and memory explores the intertwined processes by which this cephalopod was adapted to the experimental setup and marketed as a “simple” model. Amalia Sweet argues that molecular geneticist Sydney Brenner’s decision to sequence the Japanese pufferfish (Takifugu rubripes) as the first nonhuman vertebrate genome can be explained by his relationship to Japan and access to local knowledge networks. Finally, Lijing Jiang contends that the establishment of the Japanese rice fish medaka (Oryzias latipes) as an internationally recognized molecular model was directly linked to competitions and collaborations with research communities built around the better-known zebrafish.

Participants:

Siamese Fighting Fish and Humans as "Correlated" Experimental Systems in LSD-based Schizophrenia Research ***Alistair Sponsel, Tufts University***

This paper explains how the Siamese fighting fish Betta splendens came to serve as an experimental model in schizophrenia research carried out by Harold Abramson and his collaborators at the Biological Laboratory of the Long Island Biological Association beginning in the early 1950s. Intrigued by the similarity between schizophrenia and the effects of the drug LSD-25, Abramson pursued research on how LSD was metabolized by laboratory mammals. Abramson then sought a bioassay that could help him determine whether LSD reached guinea pigs’ brains, and after many trials discovered that B. splendens exhibited a distinctive behavioral response when low doses of LSD were introduced into their tank. Betta were indeed used in studying the metabolism of LSD in humans and other mammals, as well as in biochemical study of schizophrenia patients, by analysis of fishes’ response to brain extracts and urine. However, increasingly convinced that the biochemical effect of LSD was similar to the operation of a possible biochemical cause of schizophrenia in humans, Abramson and his colleagues adopted Betta as a model organism in its own right, carrying out a series of parallel studies on fish and human behavior. Abramson’s research at the laboratory ended abruptly about a decade after it began. Subsequent congressional hearings revealed that his studies of humans and fighting fish had been sponsored by the CIA with funds funneled through a private charity.

A Model of the Brain: Octopus vulgaris and the Making of the Neurosciences (1940s-1970s) ***Fabio De Sio, Heinrich Heine University Dusseldorf***

Crabs, squids, and sea snails have each played a central role in the disciplinary development of neurobiology and neuroscience. In this paper, I explore the history of yet another marine animal model --- the common octopus (Octopus vulgaris)--- as a model for the study of universal mechanisms of learning and memory. I will specifically focus on the research of the English zoologist John Zachary Young and collaborators at the Naples Zoological Station. Between 1946 and 1974, Young recruited large numbers of scientists from disparate fields --- zoology, neurology, cybernetics, and psychology --- to collaborate in the study of learning and memory in octopuses. This interdisciplinary research program rested on the assumption that O. vulgaris offered a unique combination of behavioural complexity and structural simplicity, which, in turn, made it a plausible model for the investigation of neuronal mechanisms. I seek to interrogate this foundational assumption and the claims build upon it, focusing on the intertwined processes of adapting O. vulgaris to the experimental setup, and of marketing it as a simple model.

Finding Fugu: Sydney Brenner and the Geography of the Second Vertebrate Genome ***Amalia Rose Sweet, Harvard University***

In 2002, the Japanese pufferfish (Takifugu rubripes) became the second vertebrate to have its genome sequenced in full. Not only did

the so-called “fugu” (Japanese for pufferfish) genome project open the door to comparative genomics and unprecedented study of vertebrate evolution, it also inspired a flood of new sequencing endeavors aimed at capturing the diversity of life as never before. Despite its profound influence on disparate branches of biology, spanning the gamut from evolution and ecology to molecular genetics, the project has yet to be historicized. In this paper, I seek to bring it into global perspective. The project was the brainchild of eminent molecular geneticist Sydney Brenner, who claimed to have selected the pufferfish on account of its unusually small genome. I demonstrate, however, that such intellectual considerations alone cannot explain Brenner’s choice of species. Instead, I argue that Brenner’s decision to sequence this particular species must be understood as a product of his unique relationship with Japan. I do so, first, by illustrating the role of a Japanese imaginary in the conceptualization of the project and, then, by examining how Brenner leveraged his Japanese network and local knowledge to identify and obtain samples of a particular fish. In this manner, I uncover the highly localized exchanges inadvertently erased in Brenner’s recounting of the intellectual origins of the project, revealing that even in the seemingly universal, disembodied form of a sequence, the fugu genome remains linked to the specific ecosystem and geography of the fish itself.

Crafting the Japanese Rice Fish for a World of Molecular Biology, 1985–2009 ***Lijing Jiang, Johns Hopkins University***

Since the 1910s, the Japanese rice fish, medaka (Oryzias latipes), has been continuously deployed by Japanese scientists to study a wide variety of phenomena including genetics, sex differentiation, radiation effect, and biodiversity. By the early 1980s, medaka achieved a research density, level of standardization, degree of stocking maintenance, and scale of research community consistent with that of a bona fide pre-genomic model organism. At the same time, Egami Nobuo (1925–1989), a biologist working at Tokyo University, and his colleagues at the National Institute on Radiational Sciences began to promote medaka as an international model for environmental monitoring. Medaka’s establishment as international molecular model, however, was most directly linked to competitions and collaborations with research communities of a better-known model, the zebrafish. While conducting PhD research at Tokyo University in the early 1980s, Naruse Kiyoshi (b. 1960) created diploid clones of medaka through gynogenesis following George Streisinger’s work in the zebrafish at the University of Oregon. With zebrafish’s meteoric rise as a model organism through large-scale mutagenesis screening in the 1990s, Naruse adopted various molecular cloning tools to fashion medaka as an alternative model equally or more productive than zebrafish. He eventually led a genomic sequencing project of medaka, leading to a draft genome map in 2007. In curating and interpreting molecular and genomic data, however, Naruse and his colleagues frequently praised the genetic variation and phenotypic plasticity of medaka shaped by the Japanese environments while relying on the vast store of records about medaka physiology done by Japanese researchers, reinforcing a narrative of the irreplaceable Japanese origin of the global model.

Session Organizers:

Amalia Rose Sweet, Harvard University
Alistair Sponsel, Tufts University

Chair:

Ludmila Pollock, Cold Spring Harbor Laboratory

147. Watching the Weather

Contributed Paper Session
8:00 to 9:30 am, Sunday 10 Nov.
Holiday Inn: Lobby Level - San Jacinto

Participants:

Sites of Weather Knowledge: Spanish Esconjuraderos and Mexican Posas during the Little Ice Age ***Juan Fernando Leon, Northwestern University***

My paper argues that sever meteorological episodes resulting from worsening global climate led to the adaptation of traditional solutions and the development of infrastructure to mitigate weather-related risks. While the Spanish Pyrenees grappled with unusually cold temperatures and dry spells during the most irregular phase of the Little Ice Age (1540–1715), the Yucatan Peninsula encountered the challenges of megadroughts and pluvial spikes. In response to these unexpected and different climatic adversities, communities across the Atlantic world built esconjuraderos and posas (exterior oratories) in churches, convents, and agricultural fields for priests and skilled weather conjurers to predict the weather for the harvest season and influence the path of hailstorms as necessary.

This modality of resilience reflected the salience of local atmospheric systems and ecological wisdom, as well as the existence of transatlantic circuits of weather knowledge, practice, and infrastructure. The Little Ice Age's transregional nature provides an ideal framework for connecting seemingly unrelated geographies and weather literatures, offering fresh interpretations of the human-climate interface. I use this methodology to reinterpret the use of colonial-era posas from the Central Altiplano of Mexico to the Sierra Puuc in Yucatan. Though transculturation readings have provided insights into these structures' societal role, meteorological and climatological perspectives can offer a fresh interpretation of their communal utility. These posas and the people who used them not only navigated novel climate systems but harmonized various weathercasting traditions. Apart from serving as ceremonial sites, these structures functioned as rudimentary weather observatories and early warning systems, offering critical information to improve decision-making in communities facing climatological challenges.

"The Quicksilver Experiment:" Town and Country, and Weather Data Recording by the Early Royal Society ***Brant Vogel, Independent***

At the January 16, 1660/1 meeting of the Royal Society of London, President Brouncker and Fellows Robert Boyle, Christopher Wren and astronomer (and Treasurer) William Ball were "Appointed a Committee to bring in the History of the Quicksilver Experiment." The 'barometer' was not to be named as such until 1663, but had been the subject of experiment in England since Henry Power repeated Pascal's experiments with the "Torricellian tubes" in 1653. At a meeting a year later, Ball brought "in his relation of the Quicksilver Experiment" –observations he had been keeping since 1659 on his family land in Mamhead, Devon. The document was striking enough that it was ordered to be framed. Not only had Ball recorded the changes of level of the mercury, but also the position of his "weather-glasse," place, winds, and the notable weather of the day, and laid them out in a tabular format, a format familiar to accountants, almanac makers, and astronomers. This document anticipated Wren and Robert Hooke's discussions of making a "history of the weather" c. 1663, and anticipated the format of Hooke's famous "Scheme for a History of the Weather" published in Philosophical Transactions 24 (1667). Ball's idea as formalized theoretically and visually by Hooke, disseminated in print, provided the weather diaries, published accounts, and observational programs of the long eighteenth century with a standard format—a synoptic table which lays out multiple variables and observations to one view. Centralized observations in neo-Baconian urban scientific institutions (in London, Oxford, Dublin) in buildings adapted to the purpose, shared the stage with chorographic observations taken by gentlemen at their manor houses, or on occasional excursions on their property were portraits of property. Although the observations in the Metropole would seem a contrast to the self-portraiture of country gentlemen, the actors were often the same people.

How to Write a Climate Event: Luke Howard, British Meteorology, and the Summer of 1816 ***Nayani Jensen, University of Toronto***

The 1815 eruption of Mount Tambora caused cold, rainy weather across the northern hemisphere that resulted in years of crop failures, widespread famine in Europe, an infamous 'year without a summer' in 1816, and fears of the sun going out. While Romantic literary visions of environmental disaster produced in these years (Mary Shelley's Frankenstein, Percy Shelley's Mont Blanc, Byron's Darkness) continue to hold enormous influence in popular and scholarly imagination, the response of meteorologists has been less closely examined. The early 19th century was a crucial period for the still-emerging field of meteorology, with increasing standardized record-keeping and efforts to find laws regulating the weather — all of which were challenged by the Tambora weather events. In contrast to the narratives of environmental disaster, many practitioners of meteorology incorporated data from these years into arguments for the ultimate stability of the climate, which were frequently published alongside narratives of disaster filling periodicals and daily papers. Focusing particularly on British periodicals and the work of 'father of meteorology' and namer-of-clouds Luke Howard, I argue that extreme weather of the Tambora years — and popular and Romantic responses to it — prompted practitioners to actively define the 'objective' rhetoric and role of meteorology. It also prompted an interest in global networks of data comparison and new methods of data analysis. These developments, and the active distance

created between literary and scientific modes of writing about the weather, continue to shape our current approach to communicating about weather and climate.

The Vegetable Barometer: Phenological Observations for Weather Prediction in the United States, 1770-1870 ***Valentine Delrue, Ghent University/Ca'Foscari***

In the eighteenth and early nineteenth centuries, various efforts to predict weather patterns emerged, driven by a desire to mitigate the dangers of unpredictable atmospheric conditions. Naturalists, physicists, farmers, and priests turned to a variety of observational tools, including the observation of the physiological development of plants, a practice now called phenological observation. In short, plants were thought of as instruments and they were compared to clocks (C. Linnaeus 1751), thermometers and hygrometers (C. Bjerkander 1778 & 1782), and barometers (J. Taylor 1813). Despite the growing research on plant sensibility and meteorological instruments, the question of how these different ways of reading the influence of atmospheric variations interacted remains open. This paper examines the diverse methods and skills that non-professional weather observers, such as farmers, botanists, and physicians, had developed in order to manage their daily lives. It details the weather-reading skills that lay experts developed in response to perceptions of environmental vulnerability and control. In particular, I explore the use of phenological observations on the American East Coast during the 1770s and 1870s as a tool for protection against atmospheric influences. In doing so, I examine how the perceived sensitivity of meteorological instruments and the perceived sensitivity of humans and vegetation led to different approaches to weather interpretation.

148. GECC Welcome Room Day 4

8:00 to 11:30 am, Sunday 10 Nov.
Fiesta Americana: Lobby Level - Santa Lucia

149. Exhibit Hall Day 3

8:00 to 11:30 am, Sunday 10 Nov.
Fiesta Americana: Yucatan Foyer

150. Registration Day 4

8:00 to 11:30 am, Sunday 10 Nov.
Fiesta Americana: Yucatan Foyer Registration Desk

151. Geographies and Temporalities of Nature: Global Ecologies, Local Concerns

"Futures" Roundtables
8:00 to 9:30 am, Sunday 10 Nov.
Fiesta Americana: Lobby Level - Yucatan I

The human imagination has shaped human ecologies for centuries, constructing nature in different ways to suit narratives that placed humans and natural specimens upon hierarchical scales of value, both positive and negative. As recent studies have demonstrated, these imaginative narratives of nature's past have deep philosophical, scientific, economic, and political implications on a local and global scale. Nature is hardly a stable entity, the unbroken link between the past and the present: it has always been a political and scientific domain to be imagined, reimagined and constructed time over time according to present (and often local) concerns. Its geography was constantly redrawn following new discoveries; its value has been constantly reassessed with each wave of technological innovation and the introduction of new practices of exploitation, management, and extraction. Humanity's relationship with nature, and the deep history of its influence on it, is now a central concern. This roundtable seeks to add historical depth to the debate about the Anthropocene by looking at how links between the past and the present were negotiated and constructed across time and space by a series of historical actors who 'manipulated' nature. Participants in this roundtable will explore the historicizing practices of botanists, hydraulic engineers, mathematicians, and cartographers, to highlight how nature's past served present concerns and shaped contemporary actions aimed at transforming nature, thus writing its history while creating new ecologies. The participants to this roundtable will demonstrate how the period 1500-1850 represents a key moment in this long process of transformation and reconfiguration of our planet.

Session Organizers:
Monica Azzolini, University of Bologna
Fabrizio Baldassarri, Ca Foscari University of Venice/Indiana University Bloomington

Chair:
Lydia Barnett, Northwestern University

Participants:
Omar Edgar Rodriguez Camarena, Ca' Foscari, University of Venice
Monica Azzolini, University of Bologna
Aditya Ramesh, University of Washington
Fabrizio Baldassarri, Ca Foscari University of Venice/Indiana University Bloomington

152. The HSS Annual Meetings at 100: Looking back and ahead

Sponsored Roundtable

8:00 to 9:30 am, Sunday 10 Nov.

Fiesta Americana: Lobby Level - Yucatan II

As we celebrate the HSS centennial, this roundtable brings together HSS program chairs to reflect on the role of the Annual Meeting in the life of the profession, different challenges and opportunities, and the priorities they envision for the next decades. The roundtable will pay special attention to questions about diversity and inclusion in the program, accessibility, virtual and in-person meetings, and the international role of HSS and its Annual Meeting.

Session Organizer:

Ahmed Ragab, John Hopkins University

Chair:

Ahmed Ragab, John Hopkins University

Commentators:

Jaipreet Virdi, University of Delaware

Soraya de Chadarevian, University of California, Los Angeles

Courtney Thompson

Christina Ramos, Washington University in St Louis

Donald L. Opitz, DePaul University

153. Knowledges in Motion: Technologies, Innovations, Traditions, and Exchanges during the 16th and 17th Centuries in America (Presented in Spanish)

Organized Session

8:00 to 9:30 am, Sunday 10 Nov.

Fiesta Americana: Lobby Level - Yucatan III

In the contemporary historiography of the history of science, the subject of the circulation of practices and technologies has been an issue that has helped to clarify the routes of knowledge produced after the 16th century. Instead, this panel proposes the notion of movement to examine technologies traditions, innovation practices and different strategies for problem solving in American societies of early modernity. This session brings together specialists from different areas to examine prehispanic and colonial hydraulic technologies, new visual epistemology through codices, the conceptions of the senses, and other topics.

Participants:

The Crónica X Example: Reassessing 'Authority' in Early Americas Sources ***Jaime Marroquín Arredondo, Western Oregon University***

The Crónica X, a lost 16th century manuscript in Nahuatl, has long been considered by some scholars as the ultimate source of the Aztec history accounts written by several late 16th century historians, including Diego Durán, Juan de Tovar, José de Acosta, and Fernando Alvarado Tezozomoc. In 1945, American anthropologist and historian Richard Barlow proposed a methodology for the 'recovery' of this lost 'archetype' of Aztec history. Such a program, Barlow thought, would permit the 'recovery' of a manuscript considered as "the only true source" of Aztec history. This talk analyzes Barlow's program based on the analysis of one of the documents supposedly derived from Crónica X: Juan de Tovar's Historia Mexicana (ca. 1587), also known as the Tovar Codex. It concludes that Barlow's search for Indigenous' knowledge 'authenticity' in colonial sources ultimately reveals a historiographical need for discussing and updating our understanding of Early Americas' knowledge production practices. These were as significantly different from any previous Mediterranean learned tradition as to demand redefinition.

Hybrid Navigation Technologies. Review of Cases in the New Spain Context ***Mariana Favila Vázquez, Centro de Investigaciones y Estudios Superiores en Antropología Social***

When in the first half of the 16th century the Spaniards arrived at the cultural area named today Mesoamerica, they found a system of navigations in fluvial contexts, well-organized lakes and coasts that allowed transport for short and long distances through diverse bodies of water. Very soon there were cases in which the Iberian nautical traditions and the locals began a process of reconfiguration that would lead to a new assembly of knowledge and nautical technologies that can be considered as hybrid. This was taken advantage of both sectors of Novohispanic society, the Spanish and the Indians under the control of the Spanish crown. This submission will review some specific case studies to identify this exchange of knowledge and present some initial reflections on its consequences. Cases to be reviewed include the use of brigs built for the capture of the islet of Tenochtitlán in 1521, as well as examples of boats in different latitudes of New Spain that have been recorded in historical documentary sources, cartographic and pictographic.

The Libellus of Medicinalibus Indorum Herbis Situated. An Approach to the World of the Tlacuiolo (Painter) and the New Visual Culture in New Spain ***Angélica Morales-Sarabia, Centro de Investigaciones Interdisciplinarias en Ciencias y Humanidades, Universidad***

Nacional Autónoma de México

On the Libellus de Medicinalibus Indorum Herbis (1552) hundreds of pages have been written in which it is elucidated on the meaning of its recipes and efforts have been made in the taxonomic identification of the natural resources described in its pages. In most cases his paintings have been studied with the hermeneutic resources dictated by Renaissance herbaria. We continue to ask ourselves the same questions: How precise were the paintings that the tlacuilo captured when representing the medicinal plants that Martín de la Cruz was pointing out to him? Did these respond to a mimetic pattern of nature? or Did tlacuilo incorporate additional elements resulting from ignorance of herbal resources? In this presentation I am interested in deepening the role played by the tlacuiloque in iconographic projects during the central decades of the sixteenth century, in New Spain. I am interested in undertaking a reading of Libellus which, together with other codices and maps of the time allow me to establish communication bridges between those common and/or distinctive elements, but also the differences and specificities of their production. A reading against the grain that allows me to delve into the visual culture that occurred in this turbulent period of the sixteenth century. The Tlacuiloque who painted the Map of Tenochtitlán also known as the Map of Uppsala (ca. 1550), the Codex Mendoza (1541) or the Florentine Codex shared a common element with the Libellus: experimentation. The Tlacuiloque who incorporated new materials such as European paper, book format and the Latin alphabet, perhaps even used European pens and brushes. But these materials and visual resources led them to build new languages that transformed their ways of representing the physical and metaphysical world; resignifying their pictographic systems. Their paintings were taken to new contexts without neglecting the symbolic sense of many of the old elements that incorporated in the new material supports.

Indigenous Knowledge About Nature Between New Spain and (Central) Europe ***Jana Černá, University of West Bohemian***

The aim of this contribution is to show - using as examples mainly Sahagun's and Hernandez's historia naturalis and some Jesuit ego documents - how 'hybrid' knowledge of selected naturalia of the New World had gradually emerged and how the principles of cultural translation and religious conversion were applied to it. The contribution will also show how this knowledge of certain naturalia circulated outside New Spain, especially in Central Europe, and how it became transformed, often even buried under new layers of cultural palimpsest.

The Beginning of the Ecological Transformation: The Mexican Basin through Hydraulic Practices and Political Frameworks of the 16th Century ***Teresa Villegas-López, Universidad Nacional Autónoma de México***

The rainy season of 1555 was particularly intense in the newly founded city of Mexico-Tenochtitlan. After the military conflict thirty-four years earlier, a transformative process had begun, not only politically but also in the lake landscape. Avenues that served as dams were constantly reinforced, floodgates were rebuilt allowing water control, irrigation ditches were closed, new water roads were opened or water routes were changed to transport products and people. During the month of October 1555, the viceregal authorities faced a problem that was well known to the indigenous inhabitants of the region but completely new to them: The floods. It was in this scenario of ecological conjuncture and the political response to it that the journey that would accompany the entire history of Mexico City until the twentieth century would begin: the technical possibility of controlling the waters that flooded the city. This talk will expose the political strategy carried out during the second half of the 16th century to control the waters that flooded several areas of Mexico-Tenochtitlan. It purpose is to show how the solution of technical-hydraulic problems was crossed by a colonial political environment under construction, which combined both indigenous and European knowledges.

Session Organizer:

Angélica Morales-Sarabia, Centro de Investigaciones Interdisciplinarias en Ciencias y Humanidades, Universidad Nacional Autónoma de México

Chair:

Teresa Villegas-López, Universidad Nacional Autónoma de México

154. Journal Publishing Rountable

Roundtable

8:00 to 9:30 am, Sunday 10 Nov.

Fiesta Americana: Lobby Level - Yucatan IV

Sponsored by the Graduate and Early Career Caucus

(GECC). This roundtable will feature incoming editors of Isis, editors of the Bulletin of the History of Medicine, and Tapuya (Latin American Science, Technology and Society). Panelists will discuss how to prepare a manuscript, the review process, and inclusivity and diversity in journal publishing.

Session Organizers:

Zi Yun Huang, University of Chicago
Ellie Louson, Michigan State University
Mary Kate Wolken, University of Minnesota

Chair:

Zi Yun Huang, University of Chicago

Participants:

Elise K Burton, University of Toronto
Projit Bihari Mukharji, Ashoka University
Vivette Garcia-Deister, Universidad Nacional Autónoma de México
Jeremy Greene, Johns Hopkins University
Alisha Rankin, Tufts University
Gabriela Soto Laveaga, Harvard University

155. (In)Visible Politics of Air: Sensory Knowledge and the Re-definition of Public Health

Organized Session
10:00 to 11:30 am, Sunday 10 Nov.
Fiesta Americana: 1st Floor - Izamal I

How to define the quality of air, and why do contestations over air matter? Our panel examines how indigenous, local, and other frequently marginalized communities define and challenge the states' and industries' definitions of "clean" air to push for a more inclusive and egalitarian political, social, and legal environment for less-advantaged groups. To contest governmental and industrial standards of "air," these groups gathered sensory data, devised their own methods to judge air quality, and produced new constellations of knowledge. Their studies of air rendered the often-neglected qualities of air, such as pollutants, dust, or smells, perceptible and appreciable. Our panel—with four specific case studies—shows how these local and indigenous communities collectively produced a sensory knowledge of air and re-defined public health from a bottom-up perspective. Hirano examines air pollution in Osaka and how policymakers prioritized visual evidence to define air quality and denied the pollution victims' perception of air. Dong's paper highlights Japanese coal miners' definitions of air, as she shows how miners used physical evidence to protest against the mining industries' monopoly over the standards for air quality in the coal mines. Kreikemeier's paper investigates Indigenous use of air pollution regulations in the United States in 1970s. Tribes leveraged environmental policy and drove new legislative developments. Spackman asks how communities' understandings of perceptible smells changed in relationship to changing demographics, urbanization, and an emerging regulatory regime defining clean air in the States. Taken together, these papers demonstrate the formation of local knowledge of air and how such knowledge engages with social, political, and legal structures.

Participants:

Visualizing Air Pollution in 1910s Osaka, Japan: The Photograph, Graph, and Statistical Table ***Conrad Hirano, Northwestern University***

Why, as a prominent environmental activist of postwar Japan claimed, have pollution-related policies misrepresented the bodily experiences of pollution victims? This paper traces an origin of this problem to the strategies used by the anti-air pollution campaigners of 1910s Osaka. Japan's second largest city and industrial center, Osaka has experienced severe air pollution since the late nineteenth century. As a result, in 1911, the city witnessed Japan's first anti-smoke organization chaired by the former prefectural governor and mostly composed of Osaka's business leaders. Thick air pollution was intensely visible yet became invisible (by becoming the norm) for the local population who learned to live with the dirty air. Osaka's anti-smoke campaigners thus used the photograph, graph, and statistical table to visualize and quantify their smoke problem and raise awareness for the importance of coal smoke abatement. Their reliance on visual images and numbers projected the sense of objectivity and helped them diffuse their message to the wider public. Their choices impacted the later generations of environmental activists and policy makers who also depend on the photograph, graph, and statistical table. However, photos and numbers carry their own biases (especially true for industrial smoke emissions which constantly change their shape, color, volume, direction and duration), and the emphasis on the visual ultimately misrepresents the bodily experiences of pollution victims who experience air pollution through at least four of their five senses - they can see, taste, smell, and touch the polluted air.

Miners' Lung: How Air Exposes New Political Perspectives in 1960s Japan ***Yuting Dong, University of Chicago***

In one of Japanese miners' collective lawsuits against coal mining companies, the lung from a deceased miner was presented in front of the judge as evidence. The lung was preserved in formalin according to the wishes of the miner

on his deathbed. Judges and attendees could observe black spots covering the lung, and they could also feel that the lung was as hard as the rubber bottom of a shoe. By using lungs exposed to mine air, either through x-ray scans or dissected samples, the miners and their relatives highlighted the quality and danger of the air in mines. This paper explores how the miners and medical practitioners collaborated to counter the mining companies' studies and presentations of air quality, and how grassroots activities employed various unconventional forms of evidence to make the dusty air perceptible and legible to a larger regional and national audience. This collective movement of miners is a critical episode as their interpretation, utilization, and mobilization of air as evidence became a common strategy for subsequent social movements in Japan against industrial pollution. Moreover, the miners' and medical scientists' investigations into air quality in mines and its associated health risks led to later studies on air quality and the development of dust-reduction devices. These efforts also promoted revisions of industrial regulations and laws regarding occupational illness and on-site protections. My emphasis on how miners produced and presented knowledge on air shows how air, as a material, plays a crucial role in challenging and reshaping social power and politics.

Settler Law and Environmental Sovereignty: How Native Nations Shaped Air Pollution Control in the United States ***Aly Kreikemeier, University of Idaho***

The Clean Air Act (CAA), passed in 1970, revolutionized modern environmental management in the United States through establishing federal standards and empowering the newly-established Environmental Protection Agency (EPA) to enforce them. Smog plagued cities, but rural air became an important administrative tool and arena of conflict among energy developers, rural communities, and Native Nations. Energy developers targeted rural and Tribal communities, exploiting areas with low-sulfur subbituminous coal and clear air. In the U.S. west, these deposits lie mostly in public or Tribal lands. By 1977, Tribes and environmentalists succeeded in securing a CAA provision known as the Prevention of Significant Deterioration (PSD) which prevented polluting industries from targeting areas with exceptional air quality to avoid regulations. Native Nations leveraged the CAA to gain recognition of their environmental sovereignty. Several Native nations in the Northern Plains and Rockies leveraged the PSD to demonstrate aerial sovereignty for the first time in modern American History, building on a flurry of Indigenous activism. Their actions ultimately led to the 1984 EPA policy of treating Tribes as States in the realm of environmental management, which strengthened Native sovereignty in relation to the settler state.

From Burnt Molasses to Cooked Cabbage: Changing Perceptions of Sugar Beet Processing Malodor from the 1960s to the 1980s in the U.S. ***Christy Spackman, Arizona State University***

In 2019 Michigan Sugar Co. settled with the Michigan Department of Environmental Quality, agreeing to pay a fine of $300,000 and make operational changes to mitigate odor complaints. In contrast, preliminary research reveals that a now-shuttered sugar beet factory in Chandler, AZ, appears to have left behind no mark of its olfactory impact on the neighboring environs. How has an industrial process historically known for creating persistent malodors transitioned from being largely unremarkable to unpleasantly perceptible even as the technologies and regulatory structures for managing malodors improved? Building on Melanie Kiechle's (2016) methodological suggestion that historians ask not only which odors were historically present, but also attend to how people contextually understood the odors they encountered, this paper investigates the concomitant rise in awareness of malodors from sugar beet processing with increased technological, legal, and regulatory efforts to deodorize sugar beet processing. I draw on newspaper reports, odor complaints, and oral histories to understand how inhabitants in Chandler and surrounding cities understood odors associated with the operation and shuttering of the Spreckels sugar beet factory (1964-1981). I track changes in the technological and regulatory management of processing odors, and emerging insights into potential health risks associated with smells. Even as the characteristic malodors of sugar beet processing remained consistent in form (although not necessarily in intensity), the meanings and associations with sugar production specifically, and industrial manufacturing more generally, changed. As a result, smells which once "belonged" in a community were rendered foreign and potentially dangerous.

Session Organizer:
Yuting Dong, University of Chicago
Chair:
Susan Burns, University of Chicago

156. Racial Science
Contributed Paper Session
10:00 to 11:30 am, Sunday 10 Nov.
Fiesta Americana: 1st Floor - Izamal II
Participants:

The War on Postpartum Psychosis: Elizabeth B. Davis, Family Planning, and Racial Uplift in 1960s Poor, Black Harlem *Udodiri Okwandu, Harvard University*
This paper delves into the profound impact of emphasizing family planning as a solution for poor childbearing women experiencing postpartum psychoses in the 1960s and 1970s, specifically exploring how this emphasis reinforced the pathologization of Black mothers in American urban centers. To do so, this paper examines the work of Elizabeth Bishop Davis – a Black American psychiatrist and psychoanalyst – and her team at Harlem Hospital Center. As Director of Psychiatry at Harlem Hospital Center, Davis observed that the number of Black women diagnosed with postpartum psychosis was 200 percent above the national average – a trend that reinforced broader medical discourses that articulated a link between maternal mental illness and poverty. In the absence of intervention, she argued, Black psychotic mothers would raise disorderly families, produce emotionally insecure and unstable children, and, ultimately, exacerbate the cycle of poverty that plagued the Black community. Consequently, she advocated that poor Black women with children voluntarily submit to tubal ligation and underscored the importance of family planning. While Davis envisioned her project as a means of promoting racial uplift, I contend that the efforts to diminish and regulate Black women's reproductive capacities mirrored early twentieth-century eugenic approaches to maternal mental illness. Consequently, this paper critically examines the complexities and limitations of purported Black liberatory initiatives that rely on reproductive management.

Culture Embodied: Pain, Holism, and the Racialization of the Body *Matthew Soleiman, University of California, San Diego*
This paper explores the relationship between the racialization of the body and scientific holism in late-twentieth-century North America. Over the second half of the twentieth century, scientists within the neuro and psy disciplines steadily moved away from an explicit language of “race” when describing human differences in the experience of pain. At the same time, however, many came to rely on a holistic conception of pain to account for the for the role of “culture” in such experiences. Emblematic of this holistic conception of pain was Ronald Melzack and Patrick Wall’s gate control theory, which rejected the existence of a single pain pathway in the nervous system to instead propose that pain emerged from the integration of sensory and psychological processes. In the 1970s and 1980s, this paper shows, Melzack and other researchers in North America used gate control theory to develop biocultural models of the body, reracializing pain in the process. Journalists, meanwhile, often introduced Melzack and Wall’s holistic theory to a popular audience in the context of racialized discussions about the analgesic powers of acupuncture. Through these developments, I argue, bodies were once again marked as different and organized in a hierarchical way.

Chair:
Alexis Bedolla Velázquez, Facultad de Ciencias, UNAM

157. Colonial and Imperial Science
Contributed Paper Session
10:00 to 11:30 am, Sunday 10 Nov.
Fiesta Americana: Lobby Level - Salon Celestun
Participants:

Science and Empire: Saxon Mining Experts in 18th Century New Spain *Sandra Rebok, University of California, San Diego*
In 1788 a special effort was undertaken to incorporate a number of mining experts from the Saxon Mining Academy in Freiberg into the service of the Spanish Empire and send them to the Viceroyalty of New Spain. It was an initiative promoted by the Spanish chemist Fausto de Elhuyar, who had visited the Mining Academy in Freiberg in 1783 and in 1786 was appointed General Director of Mines in Mexico, in charge of establishing the School of Mines in Mexico City and serve as its first director. The paper analyses the transfer of knowledge and technologies in the mining sector that was pursued by organizing expeditions of Saxon experts to different mining areas in New Spain. In particular, it explores questions regarding (a) the overall expectations with regard to these endeavors; (b) the way how these expeditions

were organized and undertaken; and (c) the different tasks the Saxons mining experts were expected to pursue; and (d) the specific results in the mining sector to which they led. It will furthermore highlight some representatives of these Saxon mining experts and establish a comparative view with similar efforts in other areas of the Spanish Empire, in particular, with the expedition of 15 mining experts to Peru, organized in 1786 by the German mining engineer Fürchtegott Leberecht von Nordenflycht. Moreover, it will explain to which extend Alexander von Humboldt's visit to New Spain in the frame of his exploration of the Spanish colonies (1799-1804) could profit from these previously established scientific networks.

Fishes in a Flooded Forest: Ichthyology and Economy in French Colonial Cambodia, 1930-1940 ***David J. McCaskey, University of California, Riverside***

This paper explores how the scientists of the Indochinese Oceanographic Institute uncovered the mechanisms behind the incredible productivity of Cambodia's Tonle Sap Lake, which was (and remains today) the most productive single fishery in the world. Venturing deep into freshwater environments, French ichthyologist Pierre Chevey did his most impactful scientific work figuring out how the lake's flood-pulse flooded forest ecosystem is essential to preserving the biodiversity and volume of its fish populations. When the lake's biodiversity was threatened by environmental destruction, overfishing, and social complications involving the byzantine network of fishing rights that the French inherited from the Kingdom of Cambodia, the French colonial administration called upon Chevey to undertake an extensive multi-year study of Cambodian fishes, fishing communities, and fishing techniques through the 1930s. By combining the latest advances in Western ichthyology with the local knowledge of his Khmer and Vietnamese fisher-assistants, Chevey's team worked on the lake for almost a decade. This work resulted in the creation of protected forest parks to preserve the flooded forest ecosystem responsible for the lake's productivity,a complete reform of Cambodia's fishing regulations, and the publication of Chevey's magnum opus, La Pêche dans le eaux douces du Cambodge (co-authored with civil servant Francois Le Poulain) in 1940. Along the way, the French scientists described several species new to science, worked out a new way of determining the age of tropical freshwater fishes, and came to a new understanding of the lake's various fishing communities.

Resourcing Whales: Reassessing the Natural History Museum's Cetacea Collection and its Connection to British Empire and Whaling ***Sophia Nicolov, Natural History Museum, London***

This paper is based on the project I am leading at the Natural History Museum, London, (NHM) about the links the Cetacea collection has to British Empire and whaling in the Southern Hemisphere in the twentieth century. As a historian in a traditionally scientific institution, based in the Mammal section, a collection primarily used by scientists, I emphasise the value of embedding historians in natural history collections to interrogate the colonial legacies of specimens from within. This access and collaboration with curators offers productive space to grapple with the complex and contradictory significances of specimens and the implications inherent in collections development. Focusing on cetaceans acquired from previously uninhabited territories in the South Atlantic through commercial whaling, I highlight scientific specimens' layered meanings. They are individuals with complex lives, victims of violence that severed emotional and cultural connections. They are also remnants of profound species decline and ecosystem depletion. Simultaneously, these specimens were part of formal collecting activities initiated by NHM figures from the 1910s onwards because of concerns for future survival of targeted species and with a view to bring about early regulation. This work proved pivotal in early prevention of species extinction and shaped the development of modern cetacean science. Today, specimens contribute to ongoing research as new data is extracted through evolving scientific techniques. How can we hold these significances together in institutions built on empire? What does decolonisation mean for migratory whales taken from waters removed from human habitation where no traditional relationship might be traced?

Chair:

Lan A Li, Johns Hopkins University

158. The Life and Work of the Late John L. Heilbron

Organized Session

10:00 to 11:30 am, Sunday 10 Nov.

Fiesta Americana: Lobby Level - Salon Mérida

A session to honor and remember John Heilbron, one of the most distinguished historians of the physical sciences in the world, who died unexpectedly in Padua, Italy, in November 2023. Some fourteen of John's students, collaborators, and colleagues from the United States and Europe will participate. Each will offer a brief introduction to the session and then speak for about five minutes on John as a scholar, mentor, collaborator, and/or friend.

Participants:

John Heilbron: Remembrance and Appreciation ***Daniel J. Kevles, Yale University***

Remembering John Heilbron ***Stefano Gattei***.

Session Organizers:

Daniel J. Kevles, Yale University
Jessica Riskin, Stanford University
Mario Biagioli, University of California, Los Angeles

Chair:

Daniel J. Kevles, Yale University

159. Teaching Science

Contributed Paper Session
10:00 to 11:30 am, Sunday 10 Nov.
Holiday Inn: Lobby Level - San Jacinto

Participants:

Of Rocks, Bones and a Piece of Cloth: Teaching "Object Lessons" in 19th Century Mexico ***Diana Galván***

Being in the world and comprehending it in the process is linked, inevitably, to our relationship with materiality: as we give objects significance, they give us new meanings about existence and nature. On the other hand, objects are not static: they tell us a history of circulation, transaction and intersection of narratives and practices throughout time and space. How do we learn to see the world and perceive knowledge through its objects? In my proposed presentation, I will discuss the circulation of a peculiar kind of pedagogy: "object lessons" or "leçons de choses", translated in Mexico as "enseñanza objetiva" or "lecciones de cosas". During the last decades of the 19th century, education in Mexico was profoundly and consciously altered. Science or rather what the liberal-positivist State understood as the idea of scientific instruction gradually transformed the Mexican educational system. One of the many novelties that were formally established was the teaching of "object lessons", for which Mexico bought French-built collections designed for such purposes, as well as publishing manuals for teachers and students. I address the importance of the relationship between Mexico and France for the making of a new educational system, as well as the philosophical and historical implications of teaching sciences –to both men and women– through the perception of the material world.

The Library for the Young and Constructing the Language of Imperial Science ***Franziska Elisabeth Kohlt, University of Leeds***

In early nineteenth-century Britain, reformers of scientific educational literature for children created influential tools for instilling Imperial science into young minds. Through affordable literature, and children's literature's child-family audience, their ideologically-charged languages transported rhetorically-constructed science of race and social order that can be traced in scientific language today. Yet scholarship has at times understated the intellectual scope and profound impact through languages it popularised, or the significance of children's literature in the popular education movement of this historical moment. This is exemplified in the influential Society for the Diffusion of Useful Knowledge's virtually unexplored Library for the Young, of Lord Chancellor Henry Brougham. Largely dismissed a failure, extensive archival work instead reveals a story of a vast network of uncharted influence. Reconstructed correspondence identify its authors as high-profile actors in Imperial governance, education and health; it uncovers the detailed psychological ideas behind the extensive and wide-reaching plans for the Library. It maps how aborted publications were realised through reproduction in schoolbooks, teacher and governesses training materials, informing educational policy at home and abroad through extensive circulation in the British Empire and the United States. This paper thus examines the questions raised by seemingly culturally 'neutral' children's science books, such as on entomology and geometry, about the ideological work performed by children's literature and how we think about science's neutrality in this context. An example of tracing impact of little-studied texts in unexpected places, it invites discussion of methodologies on the intersections of history of science, literature, publishing history and rhetoric.

Affective Imagery: Strategies for Teaching Astronomy at the Sonnenborgh Observatory ***Martin Bush, University of Melbourne***

The concept of epistemic images has received recent attention in the history of science. According to Lorraine Daston, epistemic images are defined as working objects of

science, capable of making an intervention in a dispute. As controversies are resolved, and the epistemological content is seen as unproblematic by a research community, images become didactic, intended to communicate the established knowledge of a discipline. Both kinds of image are routinely found in teaching collections. I propose a third type: affective images, whose function is not so much to resolve disputes or communicate knowledge, but rather to engage emotionally with students to orient them to the disciplinary community, including its history, cultural significance, social practices and aesthetics. I illustrate this category of affective images through an analysis of the teaching collection of lantern slides at the Sonnenborgh Observatory in Utrecht, and the ways in which they were deployed by Observatory Directors Albertus Antonie Nijland and Marcel Minnaert.

Steering the Bus toward Science: Expertise and Entertainment in Children's Science Media
Michael Meindl, Radford University and Virginia Tech; Matthew Wisnioski, Virginia Tech

How can fantastic fiction be used to communicate scientific reality (Kirby, 2011)? Can commercial animation (i.e., children's cartoons) be "useful" (Cook et al, 2023) in cultivating science literacy? How can its educational success be evaluated? These are some of the questions that faced "scientific storytellers" (Ockert, 2018) of The Magic School School Bus (MSB), one of the most impactful children's science enterprises of the late 20th century. This presentation first puts the science television revival of the 1990s in historical context (Boon, 2014; Cain, 2021; Dornfeld, 1994; LaFollette, 2013). It then utilizes archival research and oral histories to analyze the role of scientific and educational advisors in MSB media with a particular focus on the television series, which included producers, directors, animation artists, and performers, as well as educational and scientific advisors, many of whom were part of the series' national advisory board. This group included leading scholars in child education and development (e.g., Dr. Susan Carey) and children's use of media (e.g., Ellen Wartella), as well as experts in science media (e.g., Dr. Robert Semper). Our mixed methods approach allows us to examine how the producers of MSB envisioned the role of the show's educational and scientific experts, as well as the on-the-ground experiences and reality of the consultants themselves. Our research also examines the degree to which the advice from these experts was incorporated into production decisions, from plot to visual design, and how it helped the show be entertaining while also maintaining its scientific and educational goals. Finally, we explore how these scientific storytellers evaluated the efficacy of their collaborations.

Chair:
Florencia Pierri, MIT Museum

160. Futures of the Anthropocene: Historicizing Human-Environment Interactions

"Futures" Roundtables
10:00 to 11:30 am, Sunday 10 Nov.
Fiesta Americana: Lobby Level - Yucatan I

Motivated by a sense of planetary crisis, recent historical scholarship on the earth and environmental sciences highlights the plurality of worlds, livelihoods, and forms of knowledge created and destroyed by changing relationships to the environment, and by changes in the environment itself. These analyses tend to converge in narratives of uneven and unjustly distributed causes and effects of global climate change. But fault-lines of periodisation and chronology emerge when the urgency of collective endeavour meets pluralised histories. Among the most high-profile was the International Union of Geological Science's official rejection of the Anthropocene Epoch in February 2024. Critics cited the modern bias of the proposed period, which would have marked 1952 and nuclear fallout as the dawn of a new Anthropocene era, as insufficiently attentive to the deep history of humanity's planetary influence. Regardless of its official geological status, the Anthropocene debate signifies the promise and pitfalls of a totalizing framework for historicising humanity's impact on the environment. This roundtable brings together scholars of human-environment interactions, from the pre-modern to the present, who are collectively exploring methods to understand changing ideas and practices of extractive labour, resource use, and of "the earth" itself. What kinds of new comparisons between times and terrains (e.g. subterranean, littoral, atmospheric, celestial) can undergird future histories of the earth? How can historians build new partnerships across disciplines, and within their own, to better understand the possible futures of earth's history? And what role will historical research play in the environmental science, policy, and activism of the future?

Session Organizers:
Claire Conklin Sabel, University of Pennsylvania
Sebastian Felten, Universität Wien, Institut für Geschichte

Chair:
Claire Conklin Sabel, University of Pennsylvania
Participants:
Sebastian Felten, Universität Wien, Institut für Geschichte
Lydia Barnett, Northwestern University
Deborah Coen, Yale University
Joshua Howe, Reed College
Robert Rouphail, University of Iowa
Nydia Pineda de Avila, University of California, San Diego

161. Blood in the Water: New Perspectives on Aquatic Predators
Organized Session
10:00 to 11:30 am, Sunday 10 Nov.
Fiesta Americana: Lobby Level - Yucatan II
Historians have extensively documented how European settlers who came to North America viewed apex predators as evil, threatening beings. Shaped by deeply held fears, they began systematic campaigns to eradicate wolves, bears, cougars, and (later) coyotes; their relentless efforts eventually pushed several terrestrial predators to the brink of extinction. Scholars have also shown how twentieth-century scientists challenged the received view of predators once they discovered the central role these previously despised species played in maintaining healthy ecosystems. This session offers a fresh look at the history of our complex understandings of and experiences with apex predators, while highlighting several aquatic species that scholars have neglected. It also reveals how perceptions of predatory species have shaped the ways they have been framed as objects of scientific research, often acting as a barrier to knowledge production. Jason Colby explores how scientific and popular views of the orca, a charismatic apex marine predator commonly known as the killer whale, experienced a profound shift in the second half of the twentieth century. Janet Davis examines the symbiotic relationship between human and shark entanglements, wartime morale, and U.S. psychiatric testing protocols for military "fitness" during World War II, a global conflict that exposed millions of civilians and military personnel to psychological and real-life encounters with sharks. Tracing the rapid growth of shark science in the decades following that war, Michaela Thompson shows how the field's military past and ongoing cultural constructions cast it as a masculine endeavor and severely limited its diversity. Mark Barrow examines how long-feared crocodilians in South Florida began fulfilling a new role as surrogate species that revealed crucial information about the health of the Greater Everglades Ecosystem, a unique, extensive, and highly endangered region that scientists and resource managers began trying to restore in the late twentieth century.
Participants:

Getting to Know the Killer: The Transformation of Scientific and Popular Views of *Orcinus orca* *Jason Colby, University of Victoria*
This paper explores the shifting scientific and popular understanding of the ocean's apex predator, *Orcinus orca*, particularly in North America, in the second half of the twentieth century. Through the mid-1960s, virtually no research existed on the species. Most scientists viewed killer whales, like terrestrial predators, as dangerous pests that threatened resources and human lives alike. In the 1950s, US soldiers strafed pods of orcas in the waters of Iceland, and as late as 1961, the government of British Columbia mounted a machine gun on Vancouver Island to shoot killer whales. Scientific views changed rapidly, however, with the advent of captive study and display in the Pacific Northwest beginning in 1965. The resulting insights spurred scientists such as Michael Bigg to pioneering research on wild killer whales, even as the public embraced the once-feared "killers" as beloved "orcas"—icons of an endangered ecosystem. Drawing upon private and public archives, oral history interviews, and extensive fieldwork, this paper examines the transformation of scientific and popular understandings of killer whales in the 1960-1990 period.

Fitness for Service in Shark-infested Waters: U.S. Morale and Psychiatric Testing during World War II *Janet M Davis, University of Texas at Austin*
While scientists have identified over 500 extraordinarily diverse shark species, the best-known examples in the U.S. cultural imagination are four apex predators historically implicated in biting human beings: the oceanic whitetip; tiger; bull; and great white shark. Fatal shark bites are exceedingly rare. Yet as opportunistic foragers, sharks have appeared at sites of human trauma throughout U.S. history, which has cemented their cultural status as rapacious predators. This paper explores the symbiotic relationship between human and shark entanglements, wartime morale, and U.S. psychiatric testing protocols for military "fitness" during World War II, a global conflict that spanned vast transoceanic theaters and exposed millions of military personnel and civilians to potential encounters with sharks. Using declassified federal documents, newspapers, film, advertisements,

pamphlets, oral history interviews, and military psychiatric reports, this paper contends that World War II was a watershed period in fueling the nation's obsession with these frightening aquatic species. Newspapers frequently chronicled wartime water rescues in "shark-infested waters," while service personnel frankly acknowledged their fears of being stranded with sharks "in the water" after surviving a ship sinking or airplane crash. World War II also marked the first time in U.S. history that all branches of the armed forces administered psychiatric examinations to every enlistee, draftee, and personnel already in service. The Office of Strategic Services (OSS) concluded that fear of sharks posed a threat to wartime morale and a danger to national security. As a result, the OSS, in collaboration with the US Navy, launched a shark safety propaganda campaign in hopes of building psychologically resilient service personnel. That work culminated with the introduction of "Shark Chaser," a copper acetate repellent of dubious effectiveness in 1945.

"White Sharks and White Men": Boundary-Work Within U.S. Shark Science in the 20th Century ***Michaela Jane Thompson, Harvard University***

In 1978, Perry Gilbert, considered by many the "father of shark science," noted, "Except for occasional flutters of publicity when attacks occurred, sharks were of academic interest to only a few scientists before World War II." By the time Gilbert wrote this, three years after the release of Jaws, the situation had changed significantly. Shark science, initially tied to WWII Naval shark repellent research, had expanded far beyond its early boundaries, driven by rising numbers of shark attacks on beachgoers and skyrocketing pop cultural interest. Today, shark science still bears the imprint of its rapid growth during the 1940s-1970s, and both its military past and ongoing cultural constructions of shark science as a masculine and heroic endeavor. Until very recently, shark science has been characterized by a marked lack of diversity. In the words of one female shark scientist, "It's all white sharks and white men." Drawing upon archives, ethnographic research, and interviews, this paper examines how shark scientists within the U.S. engaged in boundary-work to limit entry to the field based on class, race, gender, and nationality. It further argues that the cultural framings of sharks and the sea, as perilous subjects requiring ruggedness and virility to engage with, worked to enforce these boundaries. Finally, it discusses recent initiatives to diversify shark science, and the reception from the shark scientist community, both positive and negative, linking it to larger trends regarding diversity, equity, and inclusion in scientific fieldwork.

Gators in the Glades: How Crocodilians Became an Environmental Indicator for Restoration of the Florida Everglades ***Mark V. Barrow, Virginia Tech***

In 2000, Congress authorized the Comprehensive Everglades Restoration Plan (CERP), a landmark initiative that sought to reverse the environmental destruction caused by a massive network of water infrastructure—dikes, levees, reservoirs, pumping stations, and more than 2000 miles of canals—that had been constructed in south Florida over the previous century to support agricultural and urban development. The threatened Everglades ecosystem was not only home for numerous endangered species but also chronically deprived of the regular, seasonally fluctuating flow of freshwater from the north it depended on to survive. Initially estimated to cost $7.8 billion dollars and require almost four decades to complete, this ambitious plan promised to finally "get the water right" in the region through the largest environmental restoration effort ever attempted. How would anyone know if CERP had fulfilled its promise to "get the water right" in the Everglades? Following the best practices of ecosystem management, the South Florida Ecosystem Task Force chose several environmental indicators that would be used to determine whether progress was being made on the plan's ambitious goals. Based on the research and advocacy of wildlife biologists, crocodilians became one of the key indicators that scientists, policymakers, and resource managers came to rely on to gauge the success of restoration efforts as they tweaked their plans over the multiple decades needed for implementation. Using oral history interviews, official reports, and scientific publications, this paper explores how the American alligator, which had long served a variety of cultural and economic roles, also began to fulfill a new scientific and policy role: as a surrogate species that revealed crucial information about the health of the unique Greater Everglades Ecosystem.

Session Organizer:

Mark V. Barrow, Virginia Tech

Chair:

Etienne Benson, Max Planck Institute for the History of Science

162. Histories of Medicine and Disease Prevention in Latin America, 18th-21st Centuries

Organized Session

10:00 to 11:30 am, Sunday 10 Nov.

Fiesta Americana: Lobby Level - Yucatan III

This panel brings together scholars interested in the history of medicine and disease in Andean South America, the Caribbean and Central America from the late eighteenth century into our present. Contributions cover a wide range of bodily ills, from epidemic and contagious diseases to chronic or ‘constitutional’ ailments and injuries. The panel’s emphasis rests on the prevention of disease and illness: in the form of vaccines and surveillance, but also in that of health advice on moderation, cleanliness, and the proper diet. The panel includes papers on sex education implemented to prevent congenital syphilis in early-twentieth century Guatemala; enlightened health advice manuals to ward off chronic, or ‘constitutional’ illnesses in late-colonial Peru; legal provisions on the preservation of the health of the enslaved in the post-1818 French Caribbean; and ideas about prevention among Peruvian state officials during the malaria epidemics of the 1920s and the COVID-19 pandemic of the 2020s, with a particular view to their use of traditional Amazonian medicine.

Participants:

Guatemala City Children and the "Dangers" of Syphilis: Local and Transnational Surveillance and Education of Venereal Diseases ***Alexandria Herrera, The University of South Carolina***

Through the late nineteenth and into the twentieth centuries, Guatemalan City elites were concerned about the long-term health effects of venereal diseases on Guatemalan citizens' bodies. Individuals who suffered from long-term, untreated syphilis infections had numerous debilitating health conditions that affected the body's vital organs. Venereal diseases had the potential to physically and mentally undermine the country's workforce, which was instrumental in fulfilling elite Guatemalans' visions for a healthy, modern, productive, economically viable country for foreign business and investment. In the 1920s, Guatemalan public health officials expanded the focus of their venereal disease surveillance and prevention infrastructure that primarily targeted Indigenous and mixed-race female sex workers to include children. Children represented both innocence and the future of the nation. If public health could not protect Guatemalan children from venereal diseases, the future of the country would be in danger. Guatemalan public health officials believed children could easily spread venereal diseases to others and suffer long-term effects from inherited congenital syphilis. This paper will explore the public health resources implemented in Guatemala City, including sexual education in city schools to warn children about the dangers of venereal disease infections. The paper will also investigate the transnational partnership between United States medical researchers and Guatemalan public health officials who used Indigenous children's bodies to examine the damage that syphilis could pose to a child's developing body. Ultimately, children's bodies were seen as the "new frontier" for transnational conversations on venereal disease prevention in the twentieth century.

Preventing Injuries and Diseases? Slavery and Health Policies in the French Caribbean Colonies (1818–1848) ***Teresa Goeltl, Universität Heidelberg***

In 1845, the enslaved woman Rosette turned to the royal prosecutor to complain that, despite her previous illness, she had been subjected to severe punishment. She emphasized her poor health condition and presented her disease-ridden body as an argument that should have spared her from it. The legal basis for such lawsuits and the ensuing trials was Article 27 of the Code Noir (1685) which governed the lives of enslaved individuals in the French Caribbean Colonies. While most of its articles imposed severe restrictions, Article 27 stipulated that slaveholders were responsible for the ‘well-being’ of the enslaved. Violations of this provision theoretically could lead to criminal charges. From the 1820s, driven by the abolitionist movement and legal reforms, a significant increase in trials of enslavers can be observed. This paper focuses on this phenomenon and examines French government’s legal measures, such as the introduction of a patronage system (1840) and the Lois Mackau (1845), aimed ad ‘regulating’ and ‘ameliorating’ slavery rather than immediately abolishing it. By reevaluating embedded slave narratives, such as Rosette’s complaint, we can question both the effectiveness and intentions of these measures. This approach significantly enriches our understanding of the experiences of enslaved individuals within an environment

hostile to their physical and mental well-being, while also highlighting the disparities between their perceptions and those of the colonial government.

'Los tercianarios padecerán mucho en sus recaidas'. Prevention of Illness in Late-Colonial Lima, 1760-1820 ***Stefanie Gänger, University of Heidelberg***

This paper is concerned with quotidian, chronic, or 'constitutional' ailments in late-colonial Spanish America: with the rheumatisms, seasonal 'fevers', and chronic venereal distempers that afflicted the inhabitants of the viceroyalties of the late 1700s and early 1800s. While the cataclysmic epidemics that devastated Latin America over the colonial period have been studied extensively, many of these conditions, feared less for their fatality than their persistence and recurrence, have eluded historians' attention. The paper's emphasis rests on the temperate, urban areas of Spanish America, especially the viceroyalty of Peru between 1760 and 1820. Thematically, its focus is on the prevention of quotidian, recurrent, or seasonal ailments: on how Limeños from various walks of life sought to ward off disease by means of the proper regimen or behaviour, to prevent relapses after recovery or shield their bodies in seasons or environs they knew to be harmful or 'febrile'. Premised upon a range of written sources, from recipe collections to enlightened health advice literature, this paper reassembles the experience, treatment, and management of recurrent, chronic, and expectable ailments that, by the late 1700s, had become a conspicuous and habitual presence in so many of our historical subjects' lives.

The Evolving Relation of Western Medicine and Traditional Peruvian Amazonian Health in Disease and Epidemic Prevention: From the 1920s Malaria Epidemics to COVID-19 ***Jorge Luis Lossio Chavez, Pontificia Universidad Catolica Del Peru***

This presentation will explore the evolving perspectives of Peruvian State health officials on the role of traditional Amazonian medicine in preventing diseases by comparing two critical moments in history: the malaria outbreaks of the 1920s and the COVID-19 pandemic of the 2020s. This analysis aims to uncover whether there has been a paradigm shift in how Western medicine views and incorporates traditional Amazonian practices for disease and epidemic prevention over the last century. Initially met with skepticism, there appears to be a growing appreciation for the preventive potential of these traditional practices, reflecting a broader trend toward integrating them into mainstream healthcare strategies. This transition, however, is not without its complexities and challenges, highlighting the ongoing negotiation between modern and traditional health paradigms. At the same time, in both traditions, there has been an emphasis on closing borders and thinking that people outside the community or nation are responsible for bringing diseases.

Session Organizer:
Alexandria Herrera, The University of South Carolina

Chair:
Alexandria Herrera, The University of South Carolina

163. New Directions in the Global History of Drugs

Organized Session
10:00 to 11:30 am, Sunday 10 Nov.
Fiesta Americana: Lobby Level - Yucatan IV

This panel bridges two strands of recently-reinvigorated scholarship: the social study of drugs and pharmaceuticals, and the global history of science and medicine. The former examines how processes of medicalization, industrialization, and experimentation shift the understanding and commoditization of therapeutic and psychoactive resources, especially in decolonizing, socialist, and non-aligned contexts. The latter tracks the circulation of ideas, experts, technologies and policies across nations and empires and their ensuing transformations, attending to the local negotiations and exchanges about where and how knowledge is produced, and for whom. Building on this scholarship, our panel focuses on four sites across the Global South (Lebanon, Mozambique, Madagascar, and the northern Amazon) to interrogate how drugs – as material, circulating objects with embodied effects – can help us to move across different scales of historical inquiry, linking up the micropolitics of drug use with the macropolitics of drug economies, as well as connecting local struggles over the protection of the environment and indigenous knowledge with wider efforts to achieve self-determination and international solidarity in questions of health equity and social justice. By integrating a broad range of geographical sites and methodological approaches across the Global South, this panel considers new directions for decolonial and transnational histories of drug production, circulation, and consumption.

Participants:

Decolonizing Drug History? A View from Lebanon ***Nour Hachem, University of California, San Diego***

In April 2020, the Lebanese parliament passed a law legalizing the cultivation, production, and exportation of cannabis for medicinal and industrial purposes in a bid to save the country's ailing economy. This came 95 years after the Mandatory French authorities heralded cannabis prohibition, a policy that the post-independence government continued. Politicians who supported legalization in 2020 advertised it as a significant developmental achievement. In reality, the law enshrines and exacerbates an unjust status-quo which, most notably, leaves out the historically marginalized cannabis-cultivating communities as well as local cannabis consumers. The law has yet to be implemented and its future is uncertain. Nevertheless, the issue of cannabis legalization raises questions about the conditions of possibility for an inclusive political economy and a broader just future for Lebanon. My research on cannabis history in Lebanon is motivated by a principle shared by various schools of thought such as decolonial theory, critical race theory, feminist theory, and critical indigenous studies - that exploring marginalized pasts can hold keys to possible more just futures. Calls for "decolonizing drug history" also tend to adhere to this tenet. What does it mean and entail in practice to "decolonize drug history" from the perspective of Lebanon and its most marginalized communities? In this talk, I share my understanding and approach to "decolonizing drug history", and the challenges I encounter in trying to do so in my ongoing research. This includes the influence on how I frame my research and its aims, the questions I ask, the sources and methods I use, and the narratives I construct. Ultimately, I argue for the importance of centering the experiences of marginalized groups who have sustained the long history of cannabis in Lebanon in trying to contribute to a just transition as the country considers cannabis legalization for economic revitalization.

Community Healing through the History of Ayahuasca and Yagé in the Northwestern Amazon ***Taylor Elizabeth Dysart, University of Pennsylvania***

In this talk, I consider ayahuasca and yagé, plant derivatives from the Amazonian lowlands, as "world-making beings" (Cruz Gutierrez, 2023). Specifically, I examine the political worlds that these plants make possible in the northwestern Amazon. Focusing on Sambaqui in Brazil and Yurayaco in Colombia, I trace how ayahuasca and yagé figure in how community members reclaim land and community after the environmental decimation and social violence brought about by armed civil conflict and settler-colonial cattle ranching. I begin this story with the first meeting of Luis Eduardo Luna, an anthropologist from Florencia, and Apolinar Jacanamijoy, an Inga taita from Yurayaco, in 1972. I situate this encounter amidst the encroachment of ranchers, which has intensified since the 1970s, and yagé's longer medicinal history in Caquetá. I then follow the trajectory of Jacanamijoy's descendants as they fought against such settler-colonial expansion and, concurrently, the violence of Colombia's conflict with las Fuerzas Armadas Revolucionarias de Colombia (Revolutionary Armed Forces of Colombia, or FARC). This talk ends with a reflection on how Luna's experimental ayahuasca plant research in Sambaqui—thousands of miles from the Amazon—might replenish the soil and communities of the region he once called home. To tell this story, I weave together sources from the private spaces of researchers, institutional archives, and fieldwork in Brazil and Colombia. I ask: If the colonial history of plants is the deracination, circulation, and taxonomic identification of plant matter, is a decolonial future for these subjects the process of putting them back into physical and metaphysical grounds?

'Studying the Plants That Cure': Interrogating Mozambique's Drug Revolution and Incomplete Traditional Medicine Integration ***Alila Brossard Antonielli, Humboldt-Universität zu Berlin***

In the late 1970s, newly independent Mozambique implemented a pharmaceutical policy aimed at rationalising drug use and increasing access to biomedicines in the country. Considered a major achievement at the time, the adoption of a restricted drug list, the mandatory use of generic denominations, centralising drug acquisition by a state-owned company and bulk acquisitions with open tenders increased the volumes of drugs purchased with a very limited budget. Mozambique's pharmaceutical policy not only made health "one of the biggest victories of the Revolution", but also participated in the debate on Essential Medicines at the World Health

Organization, challenging the major multinational pharmaceutical companies. However, traditional medicine and herbal remedies were not part of this success story. Recently collected Oral Histories interviews mentioned almost unanimously this lack of integration as one of the failures of the socialist health policies. In this communication, based on ongoing work, I will to map out how this came to be. Focusing on the traces of the attempts made by the Pharmaceutical and Therapeutics Technical Commission to study the “plants that cure”, I interrogate this project’s incompleteness. This attempt to look for the science of herbal remedies, and how traditional medicine could only be integrated if given a western scientific validation, points to Mozambique socialist leaders’ desires of modernisation. This history also opens a reflection on Mozambique’s decolonisation and its meaning in health. Biomedicine was prioritised: access to western medicine and pharmaceuticals, denied to Mozambicans during the Portuguese colonisation, meant liberation of disease, but also liberation from the “obscurantism” of traditional healers. By keeping traditional medicine and its knowledge in a marginal place, did Mozambique pharmaceutical policy maintain a form of colonisation?

Orange Pills, Red Water, White Rum: Therapeutic Resources and the Politics of Memory in Highland Madagascar ***Gabrielle Robbins, Johns Hopkins University***

This paper considers how perspectives on memory and meaning-making may enable histories of drugs and medicine grounded in marginalized communities’ embodied experiences. It examines how rural communities in highland Madagascar interpret therapeutic substances – orange anti-Covid pills produced by the Malagasy government, a distillation of cattle blood widely used as a cure-all, and homemade moonshine that moves flexibly between therapeutic and ritual contexts – to argue that these substances condense memories of previous periods of social upheaval and transformation. Orange Covid-19 pills, for example, are manufactured in the same facility that made domestic pharmaceuticals during the island’s socialist period (1975-92); the pills’ form replicates the orange antibiotics produced by the original factory. Rural communities in the central highlands spurn these orange pills, however, and prefer treatment with ranomena, a distillation of cattle blood, or toaka gasy, homebrewed moonshine. Ranomena, “red water,” also names massacre sites in the highlands during 1940s uprisings against French rule, while toaka is a vector for bodily protection and blessing which links the living with departed ancestors who impart ongoing life-force. State pharmaceuticals conjure the island's socialist self-sufficiency, but ranomena invokes earlier resistance to the death against foreign domination, and toaka distills enduring links between the living and the venerated dead: engagement with medicinal resources layers together socialist, colonial, and ancestral legacies. Moving between medicines’ material qualities and immaterial significations, this paper frames therapeutic resources as powerful vehicles for the politics of memory and therefore potent sites for subject formation.

Session Organizer:

Gabrielle Robbins, Johns Hopkins University

Chair:

Laurence Monnais, Université de Lausanne

Commentator:

Claire Ellen Edington, University of California, San Diego

PARTICIPANT INDEX

Thursday November 7, 2024

8:00am 9:00am 10:00am 11:00am 12:00pm 1:00pm 2:00pm 3:00pm 4:00pm 5:00pm 6:00pm 7:00pm

Fiesta Americana 1st Floor Izamal I				**12:00p - 1:30p** Forging National Identities		**2:00p - 3:30p** Vernacular Wartime Science: Rethinking the "Centralization" Narrative of WWII from Asian Perspectives		**4:00p - 5:30p** Beyond Reductionism: from Dirty Past to Complex Future(s)			
Fiesta Americana 1st Floor Izamal II				**12:00p - 1:30p** Scientific Cooperation between Global North and South		**2:00p - 3:30p** Rethinking Tradition and Novelty in Thirteenth Century Science		**4:00p - 5:30p** Representations of Health, Disease and Bodies in the Middle East (C19th-C20th)			
Fiesta Americana Lobby Level Montejo Terrace										**7:30p - 9:30p** HSS Opening Reception	
Fiesta Americana Lobby Level Sala de Consejo		**9:00a - 12:00p** HSS Executive Committee Meeting									
Fiesta Americana Lobby Level Salon Celestun				**12:00p - 1:30p** Human and Animal Subjects		**2:00p - 3:30p** Beyond Orientalism(s): Rethinking Approaches to Islam and the History of Science		**4:00p - 5:30p** Botanical Knowledge from New Spain to the World			
Fiesta Americana Lobby Level Salon Mérida					**1:00p - 5:00p** HSS Council Meeting						
Fiesta Americana Lobby Level Santa Lucia				**12:00p - 5:00p** GECC Welcome Room Day 1							
Fiesta Americana Yucatan Foyer Registration Desk		**9:00a - 6:00p** Registration Day 1									
Fiesta Americana Lobby Level Yucatan I				**12:00p - 1:30p** As It Was: Ontological Approaches to Violence in Cold War Latin America		**2:00p - 3:30p** The Future of Latin American in the History of Science: Emerging Scholarship from the Americas			**6:00p - 7:30p** HSS Opening Plenary: Thinking in Centuries: The Past and Future of the History of Science		
Fiesta Americana Lobby Level Yucatan II				**12:00p - 1:30p** Green Ventures: Plant Knowledge, Colonial Science, and Imperial Demands in Latin America, Eighteenth and Nineteenth Centuries		**2:00p - 3:30p** Ecology and Environment		**4:00p - 5:30p** Plastic Temporalities: Ecologies of Disposability in Science and Medicine			
Fiesta Americana Lobby Level Yucatan III				**12:00p - 1:30p** Science in Mexico		**2:00p - 3:30p** The Science and Politics of Agriculture in the Global South		**4:00p - 5:30p** New Directions in the History of Science in South Asia			

Thursday November 7, 2024

	8:00am	9:00am	10:00am	11:00am	12:00pm	1:00pm	2:00pm	3:00pm	4:00pm	5:00pm	6:00pm	7:00pm
Fiesta Americana Lobby Level Yucatan IV					**12:00p - 1:30p** Heritage, Hierarchy, and the Sciences: Revisiting 'the Impact of the New World on the Old'		**2:00p - 3:30p** Mobility and Expertise in Early Modern Mining	**4:00p - 5:30p** Plants and Empire				
Holiday Inn Lobby Level Maya					**12:00p - 1:30p** Communicating Eugenics' Past, Curbing Its Future(s)			**4:00p - 5:30p** Cold Science				
Holiday Inn Lobby Level San Jacinto					**12:00p - 1:30p** About Time		**2:00p - 3:30p** Rural Healthcare	**4:00p - 5:30p** Rethinking Scientific Figures				
Holiday Inn Lobby Level Santiago							**2:00p - 3:30p** Plants and Power: Unearthing Authority and Control in the History of Botany I	**4:00p - 5:30p** Plants and Power: Unearthing Authority and Control in the History of Botany II				

Friday November 8, 2024

	7:00am	8:00am	9:00am	10:00am	12:00pm	1:00pm	2:00pm	3:00pm	4:00pm	5:00pm	6:00pm	7:00pm
Fiesta Americana 1st Floor Izamal I			**8:00a - 9:30a** Early Sciences Forum		**10:00a - 11:30a** "Translation," Scientific Knowledge, and Collaboration in East Asia	**12:00p - 1:30p** Making Arguments in the History of Science			**3:30p - 5:00p** Transforming Land, Body, and Mind: Science and Technology as Politics in Palestine/Israel			
Fiesta Americana 1st Floor Izamal II			**8:00a - 9:30a** Pacific Circle		**10:00a - 11:30a** Religion and Science	**12:00p - 1:30p** New Directions in Medieval and Early Modern Science			**3:30p - 5:00p** Decomposing and Decaying Knowledge			
Fiesta Americana Lobby Level Salon Celestun			**8:00a - 9:30a** Forum for the History of Health, Medicine, and the Life Sciences		**10:00a - 11:30a** Debating Disability	**12:00p - 1:30p** Big Data, Necropolitics, and the Architecture of Technology in the Modern Middle East			**3:30p - 5:00p** Race, Mobility, and the Relational Contexts of Asia/America in Histories of Science and Technology			
Fiesta Americana Lobby Level Salon Mérida			**8:00a - 9:30a** Earth and Environmental Sciences Forum		**10:00a - 11:30a** Craft Knowledge	**12:00p - 1:30p** Producing the Ground: Technoscientific Makings and Unmakings of Land across the Global South			**3:30p - 5:00p** (Post-)Imperial Go-Betweens: Transdisciplinary Rereadings of Cross-Cultural Encounters			
Fiesta Americana Lobby Level Santa Lucia			GECC Welcome Room Day 2			**8:00a - 5:00p**						
Fiesta Americana Lobby Level Stelaris Bar		**7:00a - 8:00a** HSS Chair's Breakfast										
Fiesta Americana Lobby Level Vallodalid		**7:00a - 8:00a** HSS Retired Member Café y Pan Dulce										
Fiesta Americana Yucatan Foyer				Exhibit Hall Day 1		**9:00a - 5:00p**						
Fiesta Americana Yucatan Foyer Registration Desk			Registration Day 2			**8:00a - 5:00p**						
Fiesta Americana Lobby Level Yucatan I			**8:00a - 9:30a** Forum on Science and Knowledge in Latin America and the Caribbean		**10:00a - 11:30a** Routes of Indigenous and Universal Knowledges from Latin America, 1830-2030	**12:00p - 1:30p** Sarton's New Humanism in the Age of AI			**3:30p - 5:00p** Historiografías del Sur	**5:15p - 6:45p** HSS Distinguished Lecture: A scientist walks into a country...: Experiments and the Politics of Development Aid		

Friday November 8, 2024

7:00am 8:00am 9:00am 10:00am 12:00pm 1:00pm 2:00pm 3:00pm 4:00pm 5:00pm 6:00pm 7:00pm

Fiesta Americana Lobby Level Yucatan II		**8:00a - 9:30a** Forum for the History of Human Science		**10:00a - 11:30a** Approaching Détente in Uncertain Times: Historians of Anthropology Encounter Historians of the Human Sciences		**12:00p - 1:30p** Nahua Ways of Knowing: New Insights from Mesoamerican Science and Epistemology			**3:30p - 5:00p** Giving or Taking Psychology Away? Psy Sciences in Circulation			
Fiesta Americana Lobby Level Yucatan III		**8:00a - 9:30a** Forum for the History of the Chemical Sciences		**10:00a - 11:30a** Mineral Economies and Critical Minerals: The Science and Politics of Resource Designations		**12:00p - 1:30p** Interdisciplinary Approaches to 20th & 21st Century Histories of Human Difference: Race/ Ethnicity, Gender, Disability			**3:30p - 5:00p** Ottoman Science			
Fiesta Americana Lobby Level Yucatan IV		**8:00a - 9:30a** Forum for the History of Science in Asia		**10:00a - 11:30a** Medicine across Borders: Decolonizing the History of Medicine in 20th-Century Asia		**12:00p - 1:30p** Revisiting Chinese Medicine			**3:30p - 5:00p** Biomedicine			
Holiday Inn Lobby Level Maya		**8:00a - 9:30a** Back to the Future: How Historians Can Deprogram AI to Build Better Outcomes for Everyone		**10:00a - 11:30a** (Self) Surveillance, Data Visualization, and the Long History of AI from Analogue to Digital		**12:00p - 1:30p** Asilomar@50: The Past and Future of Public History of Science			**3:30p - 5:00p** Women's Work			
Holiday Inn Lobby Level San Jacinto		**8:00a - 9:30a** Forum for the History of the Mathematical Sciences		**10:00a - 11:30a** Reconsidering the Pasts of Mathematical Historiography: Math History's Strategic, Accidental, or Just Unfortunate Oversights		**12:00p - 1:30p** Osiris Vol. 39: Disability and the History of Science			**3:30p - 5:00p** Intelligence, Artificial and Otherwise			
Holiday Inn Lobby Level Santiago		**8:00a - 9:30a** Collections, Archives, Libraries, and Museums (CALM) Caucus		**10:00a - 11:30a** Mexican Commodity Frontiers and the Making of Knowledge		**12:00p - 1:30p** Mediterranean Entanglements: Rethinking Early Modern Medicine and Natural Inquiry			**3:30p - 5:00p** Women's Mentorship Event			
Quinta Montes Molina Quinta Montes Molina												**7:00p - 9:00p** HSS Centennial Banquet

Saturday November 9, 2024

7:00am 8:00am 9:00am 10:00am 12:00pm 1:00pm 2:00pm 3:00pm 4:00pm 5:00pm 6:00pm 7:00pm

Fiesta Americana 1st Floor Izamal I			**8:00a - 9:30a** Multidisciplinary Approaches to the History of Chemistry. Panel 1: Digital Humanities and Philosophical Perspectives to the History of Alchemy and Chemistry		**10:00a - 11:30a** Multidisciplinary Approaches to the History of Chemistry. Panel 2: Life Sciences, Economy and Sociopolitical Perspectives to the History of Chemistry		**12:00p - 1:30p** Reproductive Science: Comparative Perspectives on the Past; Global Inspirations for the Future			**3:30p - 5:00p** Rethinking Psychiatry and Psychology			
Fiesta Americana 1st Floor Izamal II			**8:00a - 9:30a** Fiber Histories		**10:00a - 11:30a** Exemplarity in the History of Science		**12:00p - 1:30p** Agrochemical Knowledge and Control			**3:30p - 5:00p** Bodies of Knowledge			
Fiesta Americana Lobby Level Salon Celestun			**8:00a - 9:30a** Visual Cultures of Science		**10:00a - 11:30a** Scientific Expeditions		**12:00p - 1:30p** Authors Roundtable: New Books in the History of Science and Medicine			**3:30p - 5:00p** Twentieth-century Health Politics			**7:00p - 9:00p** Centennial Pub Quiz
Fiesta Americana Lobby Level Salon Mérida			**8:00a - 9:30a** Changing Places, Realigning Knowledge: Twentieth Century Aquatic Biology in East Asia and Beyond		**10:00a - 11:30a** Space and Place in the History of Science: Where Are We Now?		**12:00p - 1:30p** New Approaches to Historical Evidence: Rethinking Indigenous and Non-European Sources			**3:30p - 5:00p** Science and its Imaginaries between the “Second” and the “Third” Worlds			
Fiesta Americana Lobby Level Salon Mérida								**1:30p - 2:30p** GECC/CoDI Listening Session					
Fiesta Americana Lobby Level Santa Lucia			GECC Welcome Room Day 3 **9:00a - 5:00p**										
Fiesta Americana Lobby Level Stelaris Bar		**7:00a - 8:00a** Women's Caucus Breakfast											**7:00p - 9:00p** HSS Graduate Student and Early Career Mixer
Fiesta Americana Yucatan Foyer			Exhibit Hall Day 2 **9:00a - 5:00p**										
Fiesta Americana Yucatan Foyer Registration Desk			Registration Day 3 **8:00a - 5:00p**										
Fiesta Americana Lobby Level Yucatan I			**8:00a - 9:30a** Beyond the R1: Roles for Historians of Science Within and Beyond the Academy (GECC Professionalization Event)		**10:00a - 11:30a** "Nuclear Nepantla: Cold War Legacies in the Southwestern US and Northern Mexico"		**12:00p - 1:30p** Collaborative Futures: Tools for Collaboration from the Making and Knowing Project			**3:30p - 5:00p** Sites of Knowledge: Spatiality, Territoriality, and Environment in Latin American Archaeology		**5:30p - 7:00p** HSS Prize Ceremony & Sarton Medalist Q&A	

Saturday November 9, 2024

7:00am 8:00am 9:00am 10:00am 12:00pm 1:00pm 2:00pm 3:00pm 4:00pm 5:00pm 6:00pm 7:00pm

Fiesta Americana Lobby Level Yucatan II		**8:00a - 9:30a** Disasters, Natural and Unnatural		**10:00a - 11:30a** Global History of Science: between circulation of knowledge and collaborative networks		**12:00p - 1:30p** Deep Time and Theories of Migration: The Ideological Uses of Geologic Time from the Mid-Nineteenth Century to the Early Twentieth Century			**3:30p - 5:00p** Moving Away from the Scientific Revolution? Where the Debate Stands Today			
Fiesta Americana Lobby Level Yucatan III		**8:00a - 9:30a** Is there an 'Ethical Turn' Occurring in the History of Science, Medicine, and Technology?		**10:00a - 11:30a** Lost Objects: Histories and Futures of Collections		**12:00p - 1:30p** Hunger in the Americas, Science and Politics			**3:30p - 5:00p** Transnational and Global Science			
Fiesta Americana Lobby Level Yucatan IV		**8:00a - 9:30a** Echoes of the International Geophysical Year in the Americas: Bridging Science and Diplomacy		**10:00a - 11:30a** Water, Wind, and Fire: Colonial Science and Indigenous Knowledge in Latin America		**12:00p - 1:30p** How to See the Invisible: Radiation Protection and Internationalist Science			**3:30p - 5:00p** Nuclear History and Tense Futures: Radiation Protection and Internationalist Science			
Holiday Inn Lobby Level Maya		**8:00a - 9:30a** At the Crossroads of the History of Music and History of Science		**10:00a - 11:30a** Making Time: Temporal Imaginaries of Scientific Practice		**12:00p - 1:30p** Observing the Observatory			**3:30p - 5:00p** Chinese and Western Science in Conversation			
Holiday Inn Lobby Level San Jacinto		**8:00a - 9:30a** Twentieth-Century Histories of Sex and Reproduction		**10:00a - 11:30a** The Futures of Public and Academic Engagement in the History of Science		**12:00p - 1:30p** Testimonies, Testimonials, and Knowledge Making across the Early Modern World			**3:30p - 5:00p** Knowing Watery Worlds: Uncertainties, Affect, and Emplaced Knowledge in the Twentieth Century			
Holiday Inn Lobby Level Santiago		**8:00a - 9:30a** Life at the Limits of Liberal Anti-Racism		**10:00a - 11:30a** Developing Environments, Producing Modernity: Histories of Science and Environment in International Development		**12:00p - 1:30p** Sciences of Vulnerability			**3:30p - 5:00p** Disputing Science			
Museo de la Luz Mérida Museo de la Luz Mérida										**5:00p - 7:00p** Elizabeth Paris Event		

Sunday November 10, 2024

	6:00am	7:00am	8:00am	9:00am	10:00am	11:00am
Fiesta Americana 1st Floor Izamal I			**8:00a - 9:30a** Diversions of Difference: Racial Science after World War II			**10:00a - 11:30a** (In)Visible Politics of Air: Sensory Knowledge and the Re-definition of Public Health
Fiesta Americana 1st Floor Izamal II			**8:00a - 9:30a** On Fieldwork. Commodity Frontiers, Labor Regimes, and Scientific Objects in Latin America, 19th-20th Centuries			**10:00a - 11:30a** Racial Science
Fiesta Americana Lobby Level Salon Ce-lestun			**8:00a - 9:30a** Urgent Histories and Activism			**10:00a - 11:30a** Colonial and Imperial Science
Fiesta Americana Lobby Level Salon Mérida			**8:00a - 9:30a** Piscine Mice: The Ascendency of Fish and Other Aquatic Animal Models in the Research Laboratory			**10:00a - 11:30a** The Life and Work of the Late John L. Heilbron
Fiesta Americana Lobby Level Santa Lucia			GECC Welcome Room Day 4		**8:00a - 11:30a**	
Fiesta Americana Yucatan Foyer			Exhibit Hall Day 3		**8:00a - 11:30a**	
Fiesta Americana Yucatan Foyer Regis-tration Desk			Registration Day 4		**8:00a - 11:30a**	
Fiesta Americana Lobby Level Yucatan I		**7:00a - 7:55a** HSS Business Meeting	**8:00a - 9:30a** Geographies and Temporalities of Nature: Global Ecolo-gies, Local Concerns			**10:00a - 11:30a** Futures of the Anthropocene: Historicizing Human-Envi-ronment Interactions
Fiesta Americana Lobby Level Yucatan II			**8:00a - 9:30a** The HSS Annual Meetings at 100: Looking back and ahead			**10:00a - 11:30a** Blood in the Water: New Perspectives on Aquatic Preda-tors
Fiesta Americana Lobby Level Yucatan III			**8:00a - 9:30a** Knowledges in Motion: Technologies, Innovations, Tradi-tions, and Exchanges during the 16th and 17th Centuries in America (Presented in Spanish)			**10:00a - 11:30a** Histories of Medicine and Disease Prevention in Latin America, 18th-21st Centuries
Fiesta Americana Lobby Level Yucatan IV			**8:00a - 9:30a** Journal Publishing Rountable			**10:00a - 11:30a** New Directions in the Global History of Drugs
Holiday Inn Lobby Level San Jacinto			**8:00a - 9:30a** Watching the Weather			**10:00a - 11:30a** Teaching Science