DEBATE

Roundtable: Global Histories of Technology in Worlds of Environmental Change

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ABSTRACT: In the face of diverse and uneven environmental crises across the globe, ongoing efforts to "globalize" the history of technology field may be considered urgent. In doing so, however, we risk uncritically exporting the norms and practices of a predominantly Western-centric field—an arguably colonial act. This roundtable explores four areas of contention: how to conceptualize "the global"; why, how and with whom to study "history" amid threatened "futures"; how to articulate and delineate the field's subject matter ("technology"); and how researchers can collaborate equitably within and across diverse sites around the globe. Building on these discussions, we propose three themes for further conversation: how to transcend the North-South binary without disregarding its critical insights; how to balance the use of locally specific vocabularies with quasi-global terms; and how to develop collaborative relationships with those whose histories historians document, fostering joint experimentation with "historiographical interventions."

KEYWORDS: global history; environmental history; historiography; temporality; futures; technology and environment; epistemic decolonization; envirotech; equitable research; Eurocentrism

Introduction

Never before has the term "global" been so ubiquitous in Western history writing. And never before has it been so contested. Especially in the field that has self-consciously called itself global history since the 1990s and early 2000s, optimistic early visions of global history as "ecumenical history" have all but faded.[1] Those who most rattle the cage of global history accuse it of uncritically appropriating—or even celebrating—post-1989 Western globalism.[2] John-Paul A. Ghobrial, a committed microhistorian, characterizes global history as a family at war with itself, fighting not only over what it is good for but also over who it is good for.[3] A decade of heated debate about epistemic decolonization has added the question of who gets to write whose histories. This debate associates the push for scholarly globalization in the European and North American academies and their global historical knowledge making with white saviorism and academic extractivism. The rampant privilege of global historians with "strong passports" was further exposed during the COVID-19 crisis.[4]

To varying degrees, these tensions both frustrate and inspire attempts to globalize the history of technology, which has also been criticized for the Western-centric assumptions hidden in dominant spatiotemporal and conceptual frameworks, research methods, narrative plots, authorship and referencing practices, and structures of scholarly organization and collaboration.[5] Curious to learn how colleagues today perceive and navigate these difficult issues, we organized a roundtable at the tenth biennial Tensions of Europe conference in 2022. The conference theme was the history of technology, resources, and the environment. We asked our panelists to reflect on the notion of global histories of technology in a time of widespread debate about environmental crises.

1. Ghobrial, "Seeing the World like a Microhistorian," which references O'Brien, "Historiographical Traditions and Modern Imperatives for the Restoration of Global History."

2. Jeremy Adelman, "What Is Global History Now?," *Aeon*, March 2, 2017; Drayton and Motadel, "The Futures of Global History"; Adelman, "Words from Jeremy Adelman"; Bell, "Words from David Bell."

3. Ghobrial, "Seeing the World," 5.

4. Alvarez, "Decolonial Studies"; Grosfoguel, "Epistemic Extractivism"; Honarmand Ebrahimi and Milford, "The Archives of Global History in a Time of International Immobility."

5. Carnino, Hilaire-Pérez, and Lamy, eds., *Global History of Techniques*; Hård, *Microhistories of Technology*; Akallah et al., "History of Technology in Global Perspectives"; Heßler, "How Should History of Technology Be Written?"; Pacey and Bray, *Technology in World Civilization*; Ammermann, "What Is Global History of Technology (Good For)?" For an overview of pre-2020 work: Hasenöhrl, "Histories of Technology and the Environment in Post/Colonial Africa." We acknowledge that these debates, though highly topical today, came rather late to the history of technology. They are much indebted to scholarship such as the following: Fanon, *Black Skin, White Masks*; Said, *Orientalism*; Spivak, "Can the Subaltern Speak?"

The roundtable focused on four themes: First, we discussed how to conceptualize "the global." Next, we discussed the second term of the phrase "global histories of technology": how to study history and temporality, and how to address the divisions between the academic study of pasts, presents, and futures. This led us to consider how to articulate our subject matter, often referred to with the last word in the phrase "global histories of technology," along with other terms we affiliate with such as "science," "environment," and "sustainability." Finally, we discussed who could and should write whose "global histories" and asked how, if at all, transnational collaborations between scholars in high-, middle-, and low-income countries could work in an equitable and reciprocal way. These four themes are interrelated in many ways, but we addressed them in turn to structure our discussions.

What follows is the result of some two years of conversations around these themes. First, we invited our panelists to reflect on the four themes in preparation for our June 2022 conference panel. These reflections were then discussed on site by the panelists and an engaged audience. This conversation was recorded, transcribed, refined, and footnoted through several iterations. We asked the panelists to present these perspectives in their own styles—although the journal's editorial process homogenized the text to reflect a Euro-American standard of English writing—and to illustrate them, where possible, with their own research. Finally, at the request of the journal reviewers, the roundtable organizers have included a brief reflection in the concluding remarks, highlighting three issues for future consideration.

Before proceeding, we feel it is important to note that while we have attempted to highlight a diversity of perspectives, our discussions inevitably remain deeply rooted in Western academia, where all the panelists and session organizers work or were trained. We therefore welcome further comments and critiques from a wider plurality of voices.

—The Organizers
(Erik van der Vleuten, Evelien de Hoop, Jonas van der Straeten)

Interrogating the Global

Erik van der Vleuten (Chair): Our first question concerns "the global" in global histories of technology and the environment. Global history has often been criticized for projecting situated European and North American histories as quasi-universal, highly normative "global" frames of reference for the histories of other regions (including frames commonly used in the history of technology, such as "industrial revolution," "modernization," "development," "technological innovation," "infrastructure," and "sustainability"). As such, "global" history can be dismissed as irrelevant or even neocolonial.[6] So, how

6. E.g., Eckert, "Scenes from a Marriage"; Alvarez, "Decolonial Studies."

does one engage with and conceptualize "the global"? How do you mobilize this term, or alternative terms, in your work? What notions of space and place are involved? And perhaps: How should we certainly not study "the global"?

Matthias Heymann: Thanks for the question. I think there is not one global but many. This complication not only helps us see why history is important but also the challenges and limits of historical research. History reveals the many uses, meanings, and understandings of the term "global." It can reveal biases and at the same time struggle to overcome them. We are used to talking about "the global economy," "global trade," "global climate change," and the like, terms that have a comprehensive, all-encompassing appeal. I do not think these terms are useful for historians. They are radical abstractions, bird's-eye views that do not provide a proper understanding. I have more sympathy for smaller-scale history, even microhistorical approaches, which help construct ideas of "the global" by looking at global entanglements in local places. Oxford historian John Darwin, discussing the prospects of global history, aptly describes this reversal of conceptualizing "the global": "Its appeal and its value lie precisely in the multiple vistas it opens up, in the connections it suggests, in the questions it asks. 'An extensive sight or view; the view of the landscape from any position,' was an early definition of 'prospect.' This might serve well to describe the prospect of global history."[7]

Consider, for example, the history of global Danish vegetable oil interests, which I have begun to work on. Danish stakeholders established trade relations and oil plantations in tropical countries to secure resources for a thriving metropolitan oil industry. But the connections go far beyond resources and involve people, ideas, knowledge, technologies, culture, languages, all sorts of things, both in local places in the tropics and in the metropole. It thus produces a multiplicity of "perspectives" that we can only see and study at the microlevel. This is why I prefer the term "entanglements" rather than "connections." Connection, flow, and circulation, important keywords in global history, seem to picture trajectories on a global map rather than entanglements in local "contact zones."[8] This is perhaps my way of conceptualizing the global. However, there is an important caveat to global history: the integral bias caused by the enormous dominance of Western sources, historians, and narratives. For the story I am interested in, so far mainly Danish authors have produced heroic national narratives about Danish colonial pioneers.[9] The global we often talk about is typically a "European global."

7. Darwin, "Afterword," 183; Vries, "The Prospects of Global History." David Pretel calls it "trans-local" (Pretel, "Hidden Connections").
8. Wenzlhuemer writes: "Transregional connections are the basic units of observation in global history" (Wenzlhuemer, *Doing Global History*, 20). Also Gänger, "Circulation"; Krige ed., *Knowledge Flows in a Global Age*; Roberts, "Situating Science in Global History," 22–23; Pratt, *Imperial Eyes*.
9. Heymann, "Investigating Global Resource Chains."

Is there still a way forward? Historians are aware of this limitation and have raised awareness about it (another argument for why history is important). Calls for attention to Indigenous perspectives, agency, and knowledge still have the disadvantage of being mostly a Western response (which is probably better than no response at all). In my small project, the idea is to develop twin stories from two different points of view, one from the Aarhus vegetable oil industry reaching out to global resources and one from the construction and operation of Danish oil plantations in Malaysia.[10] Ideally, different authors should develop these stories independently, the first written by European historians, the second by Malaysian historians.

Jethron Ayumbah Akallah: The production of non-Eurocentric histories means writing global histories. So the question is, what does global mean when we want to write global histories of technology and the environment? And I see in the Global North this universalist approach to knowledge and knowledge production and also to the flow of things and ideas. But it is the interconnectedness of things, ideas, and regions that defines the global. For me, global history is the recognition that we are somehow connected in a way and that different places are historical in their own right. However, in writing global histories, or rather interconnected histories, we do not take away the particularities and the peculiar stories and narratives that are geographically disaggregated and situated. So global becomes the idea of bringing the local into the global, into this big sphere that we have created, so that we tell these local stories and find how these local stories in themselves are connected to the larger story or the bigger story that we want to write. So for me, the global is the local that is part of a larger story of tensions, connections, contrasts, flows, and counterflows, all geographically connected or intertwined to form a whole. It would also mean making every story relevant and not patronizing knowledge production.

Evelien de Hoop: I very much appreciate the ideas shared so far, and yet I am wary of thinking in terms of a "larger," "global" history. Bringing different histories into a whole implies erasing their diverse ontologies and would thus reduce the space for different peoples and places to tell their pasts.[11] This, in turn, can have important consequences for which and whose concerns are considered valid and how responsibilities for addressing these concerns

10. Pretel and Andrade make similar arguments: Pretel, "Hidden Connections"; Andrade, "A Chinese Farmer, Two African Boys, and a Warlord." Anthropologists and geographers also provide inspiration: Tsing, "Friction"; Rankin, "Anthropologies and Geographies of Globalization."

11. This idea could be situated and more carefully developed in relation to a variety of scholarship. Key texts that inform my ideas in this dialogue include: de la Cadena and Blaser eds., *A World of Many Worlds*; Escobar, "Sustaining the Pluriverse"; Mol, *The Body Multiple*; Haraway, "Situated Knowledges."

are distributed. For example, our recent research on palm oil sustainability science (1980–2020) has highlighted how the term "global" has been predominantly mobilized by researchers affiliated with Western institutes who claim to be studying universal palm oil–related sustainability problems that everyone in the world will be affected by and should be concerned about. This has obscured diverse situated problem statements and corresponding solutions—issues that have been written about by authors with non-Western affiliations. Furthermore, and crucially, this "global" articulation also carries questionable politics by supporting the attribution of responsibility for solving these problems to those who grow palm oil in Indonesia, Malaysia, etc., rather than to those who drive the expansion of palm oil cultivation expansion (mainly in Europe and China): Sustainability science's solution statements typically expect the former (the economically poor) to radically change their livelihoods, disregarding their own interests and priorities, so that the latter (the economically rich) can continue to live their lives, and call this sustainability.[12] This example from the science of sustainability raises the question of how the term "global" functions in histories of science, technology, and the environment: Which and whose issues are foregrounded and de-emphasized, and with what political effects?

If we are to continue to use the term "global" at all—which I doubt—I would argue that it is crucial to foreground diverse histories and explore how they co-constitute each other without erasing their different ontologies (i.e., without reducing the ontology and logic of one history to that of another).[13] For example, histories of factory farming in the Netherlands may be closely intertwined with Brazilian histories of soy cultivation and ecosystem destruction, but understanding them through a single common logic (such as that of a supply chain) reduces and impoverishes understanding on both sides of the Atlantic. Instead, I would suggest that a multiplicity of situated yet interrelated stories can and should be told about any issue related to soy—that is, not just one story of factory farming and one story of ecosystem destruction, but multiple co-constituted histories of factory farming in Brazil and the Netherlands and of ecosystem destruction in the Netherlands and Brazil.[14]

Prakash Kumar: As a historian of South Asia, I follow the area studies conventions of a fine-combed analysis of the local context. But given the nature of my research on the colonial and global context of India's agricultural modernization, I combine a consideration of global patterns with an examination of the "local" in all its complexities and dimensions. Euro-American assumptions of the modern are pervasive in global constructs. European

12. De Hoop and van der Vleuten, "Sustainability Knowledge Politics."
13. De Hoop et al., "Historicising Entanglements: Science, Technology and Socio-Ecological Change in the Postcolonial Anthropocene."
14. Van der Vleuten and de Hoop, "Crisis Narratives from the Dutch Soyacene."

colonial modernity and post–World War II Americanist modernization were both complicit in the othering of alternative modes of imagining just lives in areas outside the West. Focusing on what they displaced and how that process of displacement was resisted can be insightful for developing nonuniversalizing modes of analysis. Reclaiming this engagement from the perspective of non-elites is, of course, no easy task. South Asian historiography has moved away from the earlier approach of the subaltern school, which assumed the complete autonomy of subaltern consciousness, to more recent approaches that seek the active engagement of marginalized classes and identities with the state and other elite formations in order to demand political and economic resources.[15]

Animesh Chatterjee: Following up on Matthias's point about bringing together different histories and understanding them through a common "global" logic while maintaining their specific ontologies, I think we have been quite successfully implementing this form of historical scholarship in the research project "A Global History of Technology" at TU Darmstadt, Germany. We have a diverse group of scholars—from Germany, South Korea, Latin America, India, and Tanzania—who are interested in histories (rather than the global part of "global histories") while writing from their specific local contexts. And these works—which include dissertations on local users of electricity in Dar es Salaam; the politics of urban infrastructure in colonial and postcolonial Dar es Salaam; the social history of contraceptive technologies in South Korea; a cultural history of food and cooking technologies in Latin America; and the technological landscapes of forests in Côte d'Ivoire—situate these local contexts within larger discussions of histories of technologies, looking at the local to make large-scale and somewhat global arguments about how histories of technologies can be (re)written.[16]

Histories and Temporalities

Erik: The second word in our phrase "global history of technology" is "history," or rather "histories," since we agreed to highlight their plurality. How does one conceptualize and mobilize history or histories? I'm curious about how you think about temporalities, given diverse calls to pluralize dominant chronologies in order to avoid global projections of supposedly Western linear time that enact a temporal *Gleichschaltung* (i.e., standardization) of history.[17] And how do you (not) engage with current debates about global

15. Sen, "Subaltern Collaboration and the Colonial State."
16. Hård, *Microhistories of Technology*.
17. Supposedly, because on closer inspection, "Western" discourses harbor diverse temporalities as they do spatialities: van der Straeten and Weber, "Technology and Its Temporalities."

social and environmental crises and futures, implying transcending boundaries between temporal categories of past, present, and future?[18]

Animesh: OK, so this idea of linear time is very important for writing the cultural history of electricity in colonial Calcutta, which is what I'm working on, because the colonizers believed that the West had reached a state of civilization that the rest of the world needed to catch up with and sought to impose Western linear time on the colonized, linking words like "modernity" and "modernization" with it.[19] The colonies, in this account, weren't modern enough to rule themselves, so the British had to rule them.[20] In my work, I challenge this modernist narrative that dominates histories of technologies, especially those situated in colonial contexts, by asking not only what colonizers considered modern in India but also what Indian people were doing. The answer reveals that people on the subcontinent, even within the same social groups, had very different ideas about what counted as modern, primitive, or traditional, suggesting that colonialism and even nationalism are not singular, unified ideas. For example, my work shows that for many people, electricity didn't fit into their idea of being modern. It didn't exist in their sphere of thought, so they didn't need it and were happy to use oil, gas, or kerosene lamps in their homes.[21]

Evelien: I would like to take up the question about relationships between past(s), present(s), and future(s). My interest in histories emerges from present-day concerns and my hope for a future world "in which many worlds fit."[22] Therefore, I think of time as folded: It bends and encounters itself, allowing pasts, presents, and futures to touch each other, which means that the construction of histories in the present (co)shapes how—and whose—futures are imagined. Reexamining these histories may hence open up present-day understandings of and solutions for contemporary and anticipated future challenges.

In my view, an important consequence of the previous paragraph is that we need to be open about the politics of historical research: Which and whose pasts do we (not) investigate and how? I advocate a reflexive and transdisciplinary approach to historiography: a historiography performed with and

18. Notions of "crisis" or "challenge" should not be taken at face value. Historians should ask what role they should play in current debates: van der Vleuten, "History and Technology in an Age of 'Grand Challenges'."

19. Chatterjee, *The Social Life of Electricity in Colonial Calcutta*; Barak, *On Time*.

20. Chakrabarty, *Provincializing Europe*.

21. Chatterjee, "'New Wine in New Bottles'"; Chatterjee, "Manual and Electrical Energies in the Visualisation of 'Electrical Calcutta'"; Dube, *Handbook of Modernity in South Asia*.

22. "In which many worlds fit" is a well-known phrase from the Zapatista movement's Fourth Declaration of the Lacandón Jungle.

by those whose voices (i.e., scholars and other human societal actors as well as more-than-human actors situated at various places across the world) are largely absent from existing historiography as well as contemporary conceptualizations and debates about socio-ecological challenges.[23] I would also call for investigating how historiography from the margins can challenge and reshape how those in power—including us in this room—have long understood our world(s).[24] Taking such historiography seriously requires rethinking the idea that written sources are more reliable and therefore better than oral sources; many (marginalized) histories are not—or only partially or highly selectively—documented and have long been dismissed as unresearchable, irrelevant, or not real history.[25]

Matthias: Thank you, I very much sympathize with your position and your idea of folded time.[26] I chose to study history after an education in science because I wanted to understand environmental change as a social problem. But to fold time by doing history is also to fold me (with my specific background and idiosyncratic perceptions and questions) and the past. My sense of time and urgency, for example, and the stories that flow from it, need to be complemented by other ideas and stories if we want to produce a better understanding of the complexities and ambiguities of history. We need many stories, the multiple vistas (Darwin) quoted above, to reveal the complexities of folded times, and we need to collaboratively own them to avoid the lure of simplistic visions of problem-solving.

Animesh: Yeah, so this whole idea of studying history for the future is something I'm exploring with the idea of weathering. Climate histories now focus on large scales, both temporal and spatial; everything happens on a planetary scale, everything happens over thousands of years. But people experience these large-scale changes at the microlevel through the effects and changes in the weather and the seasons. So I use the term "weathering" as a noun (the natural phenomenon studied in science and art) and "to weather" as a transitive verb (to survive or decay) to consider very local aspects—cultural, political, technological, architectural, and so forth—of everyday experiences of weather, climate, and seasons. Such an approach can add nuance to large-scale statistical narratives of climate and weather histories and can also be helpful in understanding what's happening now in places in the Global South

23. Many similar calls have been made, including for epistemic justice and epistemic freedom: e.g., Atieno-Odhiambo, "From African Historiographies to an African Philosophy of History."

24. Comaroff and Comaroff, *Theory from the South*; Bhambra, *Rethinking Modernity*.

25. Tuhiwai Smith, *Decolonizing Methodologies*.

26. This metaphor contrasts the idea of time coming apart in the modern time regime with the perception of a radical break between past, present, and future suggested by Assmann, *Ist die Zeit aus den Fugen?* Also Lorenz and Bevernage, *Breaking Up Time*.

that bear the brunt of most of the climate change we see and what's likely to happen in the future.

Prakash: There is a larger discussion to be had about the role of global history in instituting a Western-centric sense of temporality that originates in Europe's own modernity. The notion of time and discipline that is central to industrial capitalism is at cross-purpose with the sense of temporality that inhabits, for instance, the agrarian/ecological world, especially those worlds that are relatively untouched by the logic of the market. The post–World War II global history of agriculture is replete with efforts to introduce the "industrial ideal" to global farmlands. But they run into headwinds from forces that do not seek relentless profits from the earth. Some people, for instance, may be persuaded by the logic of circularity that leads them to side with soil and land conservation, while others appreciate the randomness and irregularity of crop cycles and weather patterns. The slowness of envisioned change in such agroecological worldviews sits ill at ease with the capitalist, disciplinary regimes of higher-yield strategies. We must stay alert not only to the existence of such diversity and plurality but also to the historical contingencies in which these prevailed or were sidelined. Different possible cultures of time will give us a window into different practices and meanings around objects and technologies.[27]

Jethron: When we look at time from a linear perspective, we want to tell what we assume are stories of progress. Once we become aware of this fact, then we can see that only local stories are possible, stories that are typically called vernacular or Indigenous knowledge, and we can explore mechanisms to encourage the production of these kinds of stories. We can also acknowledge that there are societies that do not have a linear view of time but see it as cyclical. Other societies view life itself as endless, believing that when people die, they reappear either as spirits or in the form of their descendants. Viewing time as cyclical shapes how one impacts and interacts with the environment. During COVID-19, for example, Madagascar refused to accept the vaccines, and the president asked the people to return to Indigenous ways. In this case, the past became an alternative, if not a backup; in everyday technologies, the old and the contemporary can coexist or support each other. The idea of a cyclical flow of time can therefore be critical to the advancement of knowledge in certain cultures. Once we become aware of such alternative perspectives, perhaps we may be able to tell the global stories of these local stories of technology, knowledge, and the environment.

Erik: So your role as a historian would be to make such cyclical temporality visible?

27. Mukharji, "Olden Times."

Jethron: Yes.

Technology, Environment, Etcetera, Etcetera

Erik: Our third question concerns the subject matter of our research and teaching: What (or who) do we write histories about, and what terms do we use to refer to that subject matter? In our work, "technology" and related terms such as "science," "environment," "sustainability," "resources," "infrastructure," "Anthropocene," and so on are ubiquitously used to engage people in conversations about what they consider to be important issues. However, they also stand accused of projecting situated Western meanings and normativities, dressed up as quasi-universal global development goals, onto the rest of the world. Some colleagues do not use the term "technology" because they see it as referring to Western science-based industrial high tech; they prefer terms they see as more inclusive (e.g., "material culture," "technique," and vernacular keywords) because they believe they make visible other ways of making, doing, and knowing.[28] Others seek to "reclaim" the term "technology" in a manner they deem more inclusive: They treat modern technology discourses as global or multi-sited phenomena or study "technological landscapes" as site-specific combinations of foreign and Indigenous, old and new, high tech and low tech.[29] Still others use cross-disciplinary concepts such as socio-technical, techno-political, and/or enviro-technical change to indicate their research subject, arguing that the separation of the constituent subject areas is analytically and/or politically problematic.[30] At stake in the choice of concepts are historiographical focus, appropriateness, politics, and the capacity of the field of history of technology to connect with relevant audiences. So, in a global history context, what terms do you use to articulate your subject matter, why, and how do you navigate these dilemmas?

Jethron: I think the question you are asking is whether we can cut a suit that fits everyone, and we all know that is impossible. But that does not stop us from doing research. I agree with David Arnold's argument that we need to move from writing histories of technologies of origin and invention that privilege the North to writing histories of meaning, use, and effect, which allow us to write local histories and interweave them with these other histories. We

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28. E.g., Carnino et al., *Global History of Techniques*; El Hariry et al., "Toward a Global History of Material Culture"; Mavhunga, *The Mobile Workshop: The Tsetse Fly and African Knowledge Production*.

29. Bray and Hahn, "The Goddess Technology Is a Polyglot"; Hård, *Microhistories of Technology*.

30. Bijker and Law eds., *Shaping Technology/Building Society*; Pritchard and Zimring, *Technology and the Environment in History*; Hecht, *Residual Governance*. The classic is Hughes, "The Seamless Web."

want to move away from the Global North's approach to research, which is to use the Global South as a source of data, and instead make it a source of knowledge. Instead of going to the South to collect data that we then theorize and conceptualize, we are now looking at the South as a source of knowledge. And I don't see any risk in adopting buzzwords like "critical infrastructure," "vulnerability," and "sustainability"; we just need to understand that they can be used differently in different contexts. Vulnerability and criticality mean one thing in the Global North and another in the Global South. It is still critical infrastructure, it is still vulnerability, but how do they play out in different places? What is critical in the context of the Global South?

Sometimes I challenge my students by asking them, "When you talk about African culture, what do you mean? What does it mean to talk about Kenyan culture, when there are about forty-six different ethnic groups in the country?" For example, food is prepared and served differently in different societies. So the one-suit idea of one-size-fits-all is problematic. Clapperton Mavhunga and colleagues' book, *What Do Science, Technology, and Innovation Mean from Africa?*, is a call to understand what science and technology mean to each society. With that understanding, we can give voice to the everyday experiences of ordinary people with technology, the everyday experiences of people with the environment. I think what is universal is the utilitarian aspect of technology, that we all derive utility from the environment, that we all make use of it. We all make use of what we have, and I think what is universal is that we want to satisfy our needs, not the ways in which we satisfy those needs.

Prakash: We need to vernacularize our methods and pursue archives in local languages to make our approach more supple. Zooming in on things or objects that count as technology outside the West may require the investigator to roam the worlds of skill and work in the non-Western worlds and to observe closely how things are done. Similarly, one may encounter voices that speak on behalf of sustainability of environments but in ways that are unfamiliar to the researcher. Ramachandra Guha's work on farmers' protests against commercial forestry in India in the 1970s recognizes voices of resistance in many different registers. The opposition of protesters against commercial fellers was broadly directed against elements of urbanization that impinged on the Himalayan idyll, and their resistance took many forms, ranging from an antiliquor movement to picketing to attacking traders. But altogether they gave voice to resistance against the introduction of commercial forestry and its impact on local environments.[31]

Evelien: Thank you, Prakash, for pointing out how diverse actors' concepts come with many different kinds of sustainability embedded in them—different

31. Guha, *The Unquiet Woods*. On Chipko: Pathak, *Hari bhari ummeed*.

from, for example, the kinds of sustainability that are on the table at the UN Conference of the Parties on climate change and on biodiversity. This observation makes me wonder whose concerns we seek to understand and address? If the ambition is to work toward "a world where many worlds fit," including those of currently marginalized actors, then I would argue that it is important to work with concepts in diverse languages. Mavhunga's work convincingly demonstrates that such a move need not impede a translocal conversation. Furthermore, I argue it would be imperative to understand the multiple meanings and performativities of terms that are dressed up as universals, such as "sustainability," "technology," "resources," and so on, and the ways in which these terms and their meanings expand or delimit spaces for diverse worlds.[32]

Bearing this in mind, I notice that (critical approaches to) dominant policies, technologies, and environmental narratives take the center stage at this conference. Research on and with alternative, vernacular, small-scale, bottom-up—for lack of better words—histories of, with, and by diverse actors is scarce in this research community. Based on the idea of fostering a pluriverse, I would argue that the latter histories and their world making (including their concepts) require much more attention.[33]

Matthias: I agree that our concepts carry a lot of hidden Western baggage, and I agree that no one suit fits all. But we need suits to do our work. I would like to bring up another issue that we have not talked about and that I am also struggling with: power and power relations. As I read and thought about my project, I searched for an appropriate suit to wear that would help me capture the diversity of forms of power and power relations in the history of tropical oil production and its agencies and impacts on people and the environment. I eventually stumbled upon the concept of repertoires of power. I immediately found it very appealing. I think it allows for the representation of many different forms of power, hard and soft, from violence and preda- tion to networking and diplomacy, science and technology, archives and ideology, and narratives and memory.[34] Originally developed for studies of the macroscale—empires in world history—this concept seems to me to be equally interesting for studies of the microscale and for the construction of narratives about the transformation of technologies and environments.[35]

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32. For example: Bruna, "Green Extractivism and Financialisation in Mozambique." Working with and studying the performativity of diverse languages' conceptualizations also requires creating room for actors's diverse normativities, including the frictions that this may give rise to, and continuously reflecting on these normativities: cf. Zuiderent-Jerak, *Situated Intervention*; Horn, "Navigating Difference in Inter- and Transdisciplinary Learning."
33. Escobar, *Designs for the Pluriverse*.
34. Daston, "The Sciences of the Archive."
35. Burbank and Cooper, *Empires in World History*.

Prakash: Historical narratives exist in archives, and South Asianists have wrestled with the question of how archives are created and how alternative voices are disempowered and subdued. There is a certain gatekeeping that is instituted at the very moment that archives are created.[36] Power and hierarchy end up predetermining what kinds of historical writing may be possible. In such a context, historians need to employ multiple strategies of reading archives against the grain, exploring the significance of the singular, the disruptive, or the "fragment," and drawing on social science theories to aid the work of historical reconstruction.

Animesh: To continue the discussion about the one-size-fits-all approach, I think one of the things that we've done—and I think Jonas van der Straeten, one of the session organizers, can attest to this as well—in our "Global History of Technology" project is to focus on people and how they make sense of technologies, rather than on the technologies themselves. So instead of looking at technologies, we're looking at material practices and material cultures and how historical actors of different genders, classes, social identities, and social groups aligned with different cultural and political causes interpret them. By shifting the focus to historical actors and social groups and moving toward the idea of material culture, we can produce very diverse histories of technologies.[37]

Plural Histories and Equitable Research Collaborations

Erik: The final question of this roundtable is about who gets to write whose histories. Histories of technologies are perhaps best pluralized by transcontinental teams of scholars with different positionalities who can bring different histories and voices to the table.[38] But how can scholars collaborate equitably and reciprocally, given their very different backgrounds and working conditions? These processes can be easily derailed. I remember a very inspiring workshop in Lisbon in 2019. Taking my first baby steps into the epistemic decolonization debate, I naively tried to address these issues by proposing to limit the number of Europe-based participants invited to this workshop to 50 percent and calling for an open discussion. But Prakash and some others there kindly reminded me that once again the Global Northers had secured the funding and set the agenda. Where is equity? Long overdue, I began to read the epistemic decolonization literature that so vociferously exposes the package of academic voyeurism, white saviorism, gold digging,

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36. Burton, *Archive Stories*.
37. El Hariry et al., "Toward a Global History"; Akallah et al., "History of Technology."
38. This collaborative aspect of transnational history characterized the Tensions of Europe community from the outset: Kaijser, "The Trail from Trail," 140–42. For background: Kranakis, "Writing Technology into History."

and extractivism that feature in so many Northern scholarly globalization initiatives.[39] I would like to revisit this issue at this roundtable. And I would like to start with Prakash.

Prakash: My remarks were off the cuff in Lisbon, and it is very generous of you to take them seriously. I was speaking from my experience of investigating civil society activism and grassroots movements in India that have opposed the entry of genetically modified (GM) Bt cotton into the country in the early 1990s. These antagonists have built a movement against GM crops since the 1990s, and it is despite their widespread opposition that the national government in India allowed the release of Bt cotton in 2002. In my research, I encountered highly professionalized anti-GM activist groups who are resourceful in training and funding. I also ran into grassroots and community movements and their leaders who were not professionalized and depend on their own resources and motivation to represent anti-GM voices on the ground. Their voices and positions are relatively unknown in the West. There is one marked distinction between the former and the latter groups on account of their respective alignment with Western donor money. The transnational activist groups from Euro-American zones usually connect with the civil society activists who are based in urban areas across India. The arrival of Northern money somehow changes the questions, concerns, and strategies of civil society actors, and the latter's distinction with the grassroots movements widens.

In my remarks, I tried to draw an analogy with how partnerships in history of technology research are initiated between, say, a center in Aarhus or Lisbon and researchers at premier institutions in India like Jawaharlal Nehru University or Presidency University (Kolkata). My questions are: How equitable is this partnership? Do your collaborators in areas outside Euro-American zones buy into your language, tone, and preferred line of questioning? Can research questions be formulated that emerge from the depths of a non-Western position? What more could you in the West do to ensure this? One possible solution may be to extend the reach of partnerships to folks beyond the elite institutions in metropolitan cities. My advocacy is for preserving the sanctity of research questions emerging from the non-West.

Erik: Thank you for that elaboration.

Jethron: I know we always discuss how unbalanced the relationship is between Western and non-Western researchers. And there are also tensions in the relationship between the North and the South, and tensions in scholarship about this relationship, but what concerns me is not who is doing and

39. Grosfoguel, "Epistemic Extractivism"; Mitova, "Decolonising Knowledge Here and Now"; Van der Vleuten, "Alternatives to Scientific Extractivism."

funding the research but how the research is being done and what is coming out of it. The reality is that we are running a hundred-meter race. The North is starting from the eighty meters, while the South is starting from zero. The South cannot catch up. So a change of focus is needed, along with what I alluded to earlier, which is the use of the South as a source of knowledge rather than a source of data for knowledge production. For me, using the South as a source of knowledge addresses the problem of how research is done and what it produces, but it does not address the tensions that already exist between the North and the South.

Matthias: Yes, I see a big challenge here. Collaborative approaches would be helpful to uncover, accept, and negotiate these tensions, so we should send Southern historians North and Northern historians South. If we leave familiar surroundings to work, the race that Jethron describes may not be so unequal. Personally, I would love to welcome Southern historians to go to meetings, do work, and visit archives in places in the Global North to start and deepen conversations, and I would love to do the same in places in the Global South. The first of many challenges is funding and time, because building such connections requires long-term, ongoing work. Regarding the tensions that Jethron mentioned, I would like to add a metaphor our keynote speaker from Singapore, May Tan-Mullins, offered yesterday: "Tensions are so important; they cause friction, and friction causes sparks, ideally sparks of inspiration."

Jethron: And maybe I think it is on the table; I think through SHOT and other sources of funding, we will be able to have a conference in Dar es Salaam next year, so the agenda is on the table.[40] And it is good that SHOT is taking this up and taking the tension to the South. It's becoming a reality, isn't it?

Animesh: As a historian of the colonial period, I would say let's not transfer the tensions of Europe to the Global South. That's what happened for four hundred years . . .

[Laughter, noise, and broad support from the audience]

Jonas van der Straeten (in the audience): I just want to respond to Prakash; your point is well taken. Many scholars from Africa and Asia whom I have worked with, for example, were trained in an environment where historiography was largely part of a postcolonial nation-building agenda. For decades, the dominant narrative in that agenda was really about techno-scientific modernity: "Yes, we have been modern too." We had this discussion about

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40. "Technology and Material Culture in African History," conference held in Dar es Salaam, Tanzania, January 4–8, 2023.

Sarkar's book.[41] So I thought, collaboration, yes, but then if I engage with this kind of scholarship, I'm probably going to end up writing more narratives about the march toward techno-scientific modernity in a certain setting. So how do you deal with that?

Evelien: Scholarship is heterogeneous, here in Denmark, in Europe, in the North, in South Asia, in African states, in the South, and so on. My work goes against dominant (modernization) narratives in the Netherlands (although it has a comfortable home in settings like this, the Tensions of Europe conference), and the same goes for those I work with in Mozambique, Brazil, or India.

In other words: I connect carefully. Of course, this does not mean that I only choose to work with people who ask the same questions, use the same concepts, or have the same priorities—but that we share some sensitivities and an interest in learning from each other. So far, such collaborations have taught me to listen much more than I was trained to do, to not automatically use the power I am often granted or feel inclined to simply take (when it comes to setting an agenda, for example), to explore unexpected limitations of the conceptual tools I was raised with as a researcher, and that I have less to offer in terms of understanding places in which I am rooted, but all the more to rethink pasts, presents, and futures in places I may call (closer to) home. As a result, I feel that my role in relation to this question is first and foremost to listen, and then perhaps to answer it together.

Erik: Animesh, did you want to jump in?

Animesh: Well, I think you almost answer the question in the way you put it. Because it is about the idea of how people understand what knowledge making is and how they perceive a certain thing or the process of knowledge making inside. So, as Jonas said, a lot of South Asian history comes from the idea that they have to catch up with the West in some ways, and what I'm trying to do historiographically is to look at where these ideas come from. What forces scholars to think this way? The answers also lie in thinking about archives and archival research both historically and historiographically.[42]

Prakash: I think this is a legitimate question: What is the value of, say, a history of electricity in India in the late nineteenth and early twentieth centuries if it tells a similar story to the construction of techno-scientific modernity through electricity in Europe earlier? Isn't that a kind of diffusionist

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41. Van der Straeten, "Review of *Let There Be Light*."

42. Chatterjee, "Everyday Interpretations of Transitions to Electricity in Colonial Calcutta"; Chatterjee, Tarazona, and Drengk, "Rethinking Global History of Technology from Alternative Archives."

perspective, implying that India is simply catching up with what was achieved earlier in the West? I believe that scholars of South Asia should always focus on bringing out the element of "difference" in India's experience of techno-scientific modernity.

Concluding Remarks by the Roundtable Organizers

After the Aarhus roundtable, our conversations continued—among the panelists, with other colleagues, and with the reviewers of this article for *Technology and Culture*. At the suggestion of the reviewers, we conclude with a reflection on issues that we believe merit further exploration.

In the roundtable, we agreed on much, including approaching global histories as plural and spatially and socially situated, yet interconnected and constantly interacting. We also agreed on challenging the tendency of scholars, especially in the West, to unreflexively project their domestic historiographical frames, questions, and working practices onto the writing of "global" histories. And we agreed that working together across West–non-West or North-South divides is worthwhile, even if many questions remain about how to work together in reciprocal ways.

These points of agreement suggest three further issues that we would like to nominate for further discussion and research. The first is our (over) reliance on binaries such as West–non-West and North-South. Our round-table routinely framed the four issues we were considering—temporality, spatiality, research subject, and transnational collaboration—in terms of competing Western and non-Western meanings and practices. This prob-lematic binary simplifies the colonial encounter and privileges it over other encounters, which runs against our intention to make research more plural. It problematically associates technology, sustainability, modernization, etc. with the West and appropriation, resistance, and alternative ideas with the non-West. Francesca Bray and Barbara Hahn have recently argued that supposedly Western meanings of technology as modern industrial high tech actually emerged from a polyglot global conversation; they claim that labeling modern technology as "Western" is an act of "epistemic violence" because it erases non-Western contributions.[43] Conversely, supposedly "non-Western" appropriations, resistances, and alternative ideas are also ubiquitous in Western history.[44] One of the reviewers of this paper noted, for example, that while our conversation associated linear temporalities with the West and alternatives with the non-West, linear and nonlinear ideas of time may have emerged historically across the globe.[45] Indeed, the reviewer asked whether

43. Bray and Hahn, "Goddess Technology," 277.
44. Van der Vleuten, "Pluralizing 'Eurocentric' Technology Discourses 'Back Home.'"
45. Barak, *On Time*; Ogle, *The Global Transformation of Time*.

"the Western world itself even in its 'modern' guise does not *totally* have circular temporalities or ways of thinking circularly in time"?[46]

West–non-West and North-South binaries thus collapse historiographically (along with many other binaries; the world is plural, not dualistic).[47] Yet we continue to invoke these same binaries to highlight the role of geography in perpetuating global inequalities, not least in relation to coloniality; such geographical power differentials must not be obscured. How to navigate these conflicting impulses?

The second issue that we would like to nominate for further debate concerns the terminology we use to describe the object of our academic community's research. Some panelists and other colleagues proposed alternative terms to "technology" to encourage the study of more diverse ways of making, doing, and knowing around the globe, such as different material practices, material cultures, techniques, and vernacular terms. Our conversation (as well as that of one of the reviewers of this paper) made clear that such alternative terminology, while important, limits the ability of our work and the history of technology as a field to engage scholars and audiences in a common conversation, a concern that is by no means new. Indeed, in his SHOT presidential address over two decades ago, Terry Reynolds implored scholars not to burn bridges with traditional history of technology audiences (not least the engineering world and broader publics) at a time when they were embracing, among other terminologies, the new conceptual language of social constructivism.[48]

This debate about the use of shared concepts for the sake of conversation is intertwined with debates about the ambitions of the field and its relationship to other fields of study. Many colleagues approach the field of history of technology as a specialized subdiscipline of history concerned with the human-made material world, however defined. Others take as their starting point the intertwined histories of scientific, technological, social, and environmental change, approaching history of technology as an interdisciplinary field and an explicit countermove to academic fragmentation—a concern that also informed the founding of SHOT and *Technology and Culture* many years ago, and that may have renewed relevance in the study of diverse but interacting crises.[49] Some draw on science and technology studies, exploring the socio-technical or techno-political; others engage with environmental history, studying, for example, enviro-tech history. Such interdisciplinary engagements broaden the range of concepts we can draw upon and thus compound the dilemma between promoting conceptual innovation and

46. Communication to author, December 22, 2023.
47. Law and Lin, "Provincializing STS."
48. Reynolds, "On Not Burning Bridges," 525.
49. Kranzberg, "At the Start"; van der Vleuten, "Technology, Societal Challenges, and Global Sustainability History."

diversification or using a common set of familiar terms for the sake of a common conversation with different audiences. We invite further discussion of such questions of scholarly identity, historical plurality, and audiences for the field of history of technology in an age of global environmental concern.

Our third point for further debate is how a global history of technology might engage more deeply with contemporary concerns, actors, and agents. While our roundtable addressed how different historians collaborate across North-South divides, we scarcely discussed possible collaborations with those whose histories are being written, even though most panelists engage with contemporary agents while writing contemporary histories. In the European academy, and perhaps elsewhere, this question is particularly relevant because professional historians are expected to engage with external publics to "give back to society." In global history, exploring the idea of giving back is even more pertinent because of existing critiques of patronizing, belittling, and/or extractivist Western research of non-Western topics.[50]

These challenges sometimes provoke defensive responses from colleagues, but we believe that more constructive responses are possible. There is already a substantial amount of engagement work going on in technological and environmental history. Timothy Moss and Heike Weber, who edited a special issue on this topic, argue that these fields are at the forefront of experiments in historiographical engagement, drawing on notions of usable pasts, public and applied history, history policy networks, and so on.[51] These approaches, however, sometimes risk reproducing a linear model of ivory tower knowledge production and subsequent "application" and "use."[52] Alternatively, they reverse this model and cast historical research as serving the normativities and politics of selected clients. We would like to explore the idea of historiographical engagement not in terms of a push model of applied history or a pull model of engaged scholarship but as a situated intervention—an engagement in which the simultaneous development of new historical knowledges, present practices, and future imaginaries (including the normativities embedded in them) constitutes a site of experimentation and study: the historiographical intervention.[53] Of course, such two-way engagement between future makers and history makers raises tricky questions in local contexts,

50. Grosfoguel, "Epistemic Extractivism"; Teaiwa, "Ruining Pacific Islands"; Meneses, "Doing Anthropology in Uncertain Contexts"; Hau'ofa, "Our Sea of Islands."

51. Moss and Weber, "Technik-und Umweltgeschichte als Usable Pasts." History of technology and environmental history conferences are currently hosting sessions and working groups on history and policy, e.g., Jonathan Coopersmith's history of technology and policy network and the Environmental History for Policy network (https://envhist4p.org/).

52. Indeed, they risk replicating the very sort of linear model that previous generations of historians of technology dismantled as they built their own field: Staudenmaier, *Technology's Storytellers.*

53. Our proposal of the historiographical intervention takes its inspiration from Zuiderent-Jerak, *Situated Intervention.*

let alone a transnational and global history context, such as how to work with multiple actors across the globe.[54] Nevertheless, we believe the effort should be made, not least because the environmental and socio-technical challenges facing both historiography and transformative research cannot be met by parochialist approaches. We certainly hope to discuss this matter in future roundtables.

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Bibliography

Published Sources

Adelman, Jeremy. "Words from Jeremy Adelman." *Journal of Global History* 13, no. 1 (2021): 18–21.

54. Van der Vleuten, "Transnational, Transformative, and Transdisciplinary Histories."

Akallah, Jethron Ayumbah, Nelson Arellano-Escudero, Animesh Chatterjee, Sławomir Łotysz, Saara Matala, Min Fanxiang, Stefan Poser, Hugh R. Slotten, and Magdalena Zdrodowska. "History of Technology in Global Perspectives." *ICON: Journal of the International Committee for the History of Technology* 29, no. 1 (2024): 9–45.

Alvarez, Silvia T. "Decolonial Studies: Contributions to the Construction of Global History." *Društveni horizonti* 2, no. 4 (2022): 143–64.

Ammermann, Friedrich N. "What Is Global History of Technology (Good For)?" *Global Histories: A Student Journal* 6, no. 2 (2021): 74–78.

Andrade, Tonio. "A Chinese Farmer, Two African Boys, and a Warlord: Toward a Global Microhistory." *Journal of World History* 21, no. 4 (2010): 573–92.

Arnold, David. "Europe, Technology, and Colonialism in the 20th Century." *History and Technology* 21, no. 1 (2005): 85–106.

Assmann, Aleida. *Ist die Zeit aus den Fugen? Aufstieg und Fall des Zeitregimes der Moderne*. Munich: Carl Hanser, 2013.

Atieno-Odhiambo, E. S. "From African Historiographies to an African Philosophy of History." In *Africanizing Knowledge: African Studies Across the Disciplines*, edited by Toyin Falola and Christian Jennings, 13–63. London: Routledge, 2002.

Barak, On. *On Time: Technology and Temporality in Modern Egypt*. Berkeley: University of California Press, 2013.

Bell, David. "Words from David Bell." *Journal of Global History* 13, no. 1 (2021): 16–18.

Bhambra, Gurminder K. *Rethinking Modernity: Postcolonialism and the Sociological Imagination*. New York: Palgrave Macmillan, 2012.

Bijker, Wiebe E., and John Law, eds. *Shaping Technology/Building Society: Studies in Sociotechnical Change*. Cambridge, MA: MIT Press, 1994.

Bray, Francesca, and Barbara Hahn. "The Goddess Technology Is a Polyglot: A Critical Review of Eric Schatzberg, *Technology: Critical History of a Concept*." *History and Technology* 38, no. 4 (2022): 275–316.

Bruna, Natacha. "Green Extractivism and Financialisation in Mozambique: The Case of Gilé National Reserve." *Review of African Political Economy* 49, no. 171 (2022): 138–60.

Burbank, Jane, and Frederick Cooper. *Empires in World History: Power and the Politics of Difference*. Princeton: Princeton University Press, 2011.

Burton, Antoinette, ed. *Archive Stories: Facts, Fictions, and the Writing of History*. Durham: Duke University Press, 2005.

Carnino, Guillaume, Liliane Hilaire-Pérez, and Jérôme Lamy, eds. *Global History of Techniques (19th–21st Centuries)*. Turnhout: Brepols, 2024.

Chakrabarty, Dipesh. *Provincializing Europe: Postcolonial Thought and Historical Difference*. Princeton: Princeton University Press, 2008.

Chatterjee, Animesh. "Everyday Interpretations of Transitions to Electricity in Colonial Calcutta, c. 1875–1940s." *Regeneration* 1, no. 3 (forthcoming, 2025).

Chatterjee, Animesh. "Manual and Electrical Energies in the Visualisation of 'Electrical Calcutta,' c. 1890–1925." *Journal of Energy History* 8 (2023). http://www.energyhistory.eu/en/special-issue/manual-and-electrical -energies-visualisation-electrical-calcutta-c-1890-1925.

Chatterjee, Animesh. "'New Wine in New Bottles': Class Politics and the 'Uneven Electrification' of Colonial India." *History of Retailing and Consumption* 4, no. 1 (2018): 94–108.

Chatterjee, Animesh. *The Social Life of Electricity in Colonial Calcutta, c.1875– 1945*. London: Routledge, forthcoming.

Chatterjee, Animesh, Alejandra Osorio Tarazona, and David Drengk. "Rethinking Global History of Technology from Alternative Archives." *Technikgeschichte* 88, no. 2 (2021): 202–6.

Comaroff, Jean, and John L. Comaroff. *Theory from the South; or, How Euro-America Is Evolving toward Africa*. New York: Routledge, 2012.

Darwin, John. "Afterword: History on a Global Scale." In *The Prospect of Global History*, edited by James Belich, John Darwin, Margret Frenz, and Chris Wickham, 178–184. Oxford: Oxford University Press, 2016.

Daston, Lorraine. "The Sciences of the Archive." *Osiris* 27, no. 1 (2012): 156–87.

de Hoop, Evelien, Aarthi Sridhar, Claiton da Silva, and Erik van der Vleuten. "Historicising Entanglements: Science, Technology and Socio-Ecological Change in the Postcolonial Anthropocene." *Global Environment: Journal of Transdisciplinary History* 15, no. 2 (2022): 195–208.

de Hoop, Evelien, and Erik van der Vleuten. "Sustainability Knowledge Politics: Southeast Asia, Europe and the Transregional History of Palm Oil Sustainability Research." *Global Environment: Journal of Transdisciplinary History* 15, no. 2 (2022): 209–45.

de la Cadena, Marisol, and Mario Blaser, eds. *A World of Many Worlds*. Durham: Duke University Press, 2018.

Drayton, Richard, and David Motadel. "The Futures of Global History." *Journal of Global History* 13, no. 1 (2018): 1–15.

Dube, Saurabh, ed. *Handbook of Modernity in South Asia: Modern Makeovers*. New Delhi: Oxford University Press, 2011.

Eckert, Andreas. "Scenes from a Marriage: African History and Global History." *Comparativ* 29, no. 2 (2019): 36–51.

El Hariry, Shorouk, Mikael Hård, Youngyu Lee, Mariya Petrova, and Dennis Yazici. "Toward a Global History of Material Culture." *Technikgeschichte* 88, no. 2 (2021): 180–84.

Escobar, Arthuro. *Designs for the Pluriverse: Radical Interdependence, Autonomy, and the Making of Worlds*. Durham: Duke University Press, 2018.

Escobar, Arturo. "Sustaining the Pluriverse: The Political Ontology of Territorial Struggles in Latin America." In *The Anthropology of Sustainability*, edited by Marc Brightman and Jerome Lewis, 237–56. New York: Palgrave Macmillan, 2017.

Fanon, Frantz. *Black Skin, White Masks*. London: Pluto Press, 1986. Originally published in 1952.

Gänger, Stefanie. "Circulation: Reflections on Circularity, Entity, and Liquidity in the Language of Global History." *Journal of Global History* 12, no. 3 (2017): 303–18.

Ghobrial, John-Paul A. "Seeing the World like a Microhistorian." *Past and Present* 242, no. 14 (2019): 1–22.

Grosfoguel, Ramón. "Epistemic Extractivism: A Dialogue with Alberto Acosta, Leanne Betasamosake Simpson, and Silvia Rivera Cusicanqui." In *Knowledges Born in the Struggle: Constructing the Epistemologies of the Global South*, edited by Boaventura de Sousa Santos and Maria Paula Meneses, 203–18. London: Routledge, 2020.

Guha, Ramachandra. *The Unquiet Woods: Ecological Change and Peasant Resistance in the Himalaya*. Berkeley: University of California Press, 2000.

Haraway, Donna. "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective." *Feminist Studies* 14, no. 3 (1988): 575–99.

Hård, Mikael. *Microhistories of Technology: Making the World*. Cham: Springer, 2023.

Hasenöhrl, Ute. "Histories of Technology and the Environment in Post/Colonial Africa: Reflections on the Field." *Histories* 1, no. 3 (2021): 122–44.

Hau'ofa, Epeli. "Our Sea of Islands." *Contemporary Pacific* 6, no. 1 (1994): 148–61.

Hecht, Gabrielle. *Residual Governance: How South Africa Foretells Planetary Futures*. Durham: Duke University Press, 2023.

Heßler, Martina, ed. "How Should History of Technology Be Written? Challenges of a Global History of Technology." Special issue, *Technikgeschichte* 88, no. 2 (2021): 175–213.

Heymann, Matthias. "Investigating Global Resource Chains: The Case of the Global Danish Plant Oil Complex." *Ferrum* 92 (2022): 58–65.

Honarmand Ebrahimi, Sara, and Ismay Milford. "The Archives of Global History in a Time of International Immobility." *Historical Research* 95, no. 270 (2022): 586–97.

Horn, Annemarie. "Navigating Difference in Inter- and Transdisciplinary Learning." Ph.D. diss., Vrije Universiteit Amsterdam, 2023.

Hughes, Thomas P. "The Seamless Web: Technology, Science, Etcetera, Etcetera." *Social Studies of Science* 16, no. 2 (1986): 281–92.

Kaijser, Arne. "The Trail from Trail: New Challenges for Historians of Technology." *Technology and Culture* 52, no. 1 (2011): 131–42.

Kranakis, Eda. "Writing Technology into History." *Technology and Culture* 62, no. 1 (2021): 212–40.

Kranzberg, Melvin. "At the Start." *Technology and Culture* 1, no. 1 (1959): 1–10.

Krige, John, ed. *Knowledge Flows in a Global Age: A Transnational Approach*. Chicago: University of Chicago Press, 2022.

Law, John, and Wen-yuan Lin. "Provincializing STS: Postcoloniality, Symmetry, and Method." *East Asian Science, Technology and Society: An International Journal* 11, no. 2 (2017): 211–27.

Lorenz, Chris, and Berber Bevernage, eds. *Breaking Up Time: Negotiating the Borders between Present, Past and Future*. Göttingen: Vandenhoeck & Ruprecht, 2013.

Mavhunga, Clapperton Chakanetsa. *The Mobile Workshop: The Tsetse Fly and African Knowledge Production*. Cambridge, MA: MIT Press, 2018.

Meneses, Maria Paula. "Doing Anthropology in Uncertain Contexts: Patchwork Ethnography in Mozambique." *Anthropology Southern Africa* 46, no. 2 (2023): 121–35.

Mitova, Veli. "Decolonising Knowledge Here and Now." *Philosophical Papers* 49, no. 2 (2020): 191–212.

Mol, Annemarie. *The Body Multiple: Ontology in Medical Practice*. Durham: Duke University Press, 2003.

Moss, Timothy, and Heike Weber. "Technik-und Umweltgeschichte als Usable Pasts: Potenziale und Risiken einer angewandten Geschichtswissenschaft." *Technikgeschichte* 88, no. 4 (2021): 367–78.

Mukharji, Projit. "Olden Times: Watches, Watchmaking and Temporal Culture in Calcutta, c. 1757–1857." In *On Modern Indian Sensibilities: Culture, Politics, History*, edited by Ishita Banerjee-Dube and Sarvani Gooptu, 99–119. London: Routledge, 2018.

O'Brien, Patrick. "Historiographical Traditions and Modern Imperatives for the Restoration of Global History." *Journal of Global History* 1, no. 1 (2006): 3–39.

Ogle, Vanessa. *The Global Transformation of Time: 1870–1950*. Cambridge, MA: Harvard University Press, 2015.

Pacey, Arnold, and Francesca Bray. *Technology in World Civilization: A Thousand-Year History*. Rev. ed. Cambridge, MA: MIT Press, 2021.

Pathak, Shekhar. *Hari bhari ummeed: Chipko andolan aur anya janglaat pratirodhon ki Parampara* [Green hope: The legacy of the Chipko movement and other forest protests]. New Delhi: Vani Prakashan, 2019.

Pratt, Mary Louise. *Imperial Eyes: Travel Writing and Transculturation*. London: Routledge, 2007.

Pretel, David. "Hidden Connections: The Global History of Jungle Commodities." *Technology and Culture* 64, no. 1 (2023): 202–19.

Pritchard, Sara B., and Carl A. Zimring. *Technology and the Environment in History*. Baltimore: Johns Hopkins University Press, 2020.

Rankin, Katharine N. "Anthropologies and Geographies of Globalization." *Progress in Human Geography* 27, no. 6 (2003): 708–34.

Reynolds, Terry S. "On Not Burning Bridges: Valuing the Passé." *Technology and Culture* 42, no. 3 (2001): 523–30.

Roberts, Lissa. "Situating Science in Global History." *Itinerario* 33, no. 1 (2009): 9–30.

Said, Edward. *Orientalism*. New York: Pantheon Books, 1978.

Sen, Dwaipayan. "Subaltern Collaboration and the Colonial State." *Economic and Political Weekly* 57, no. 37 (2022): 4–5.

Spivak, Gayatri Chakravorty. "Can the Subaltern Speak?" In *Marxism and the Interpretation of Culture*, edited by Cary Nelson and Lawrence Grossberg, 271–313. Urbana: University of Illinois Press, 1988.

Staudenmaier, John M. *Technology's Storytellers: Reweaving the Human Fabric*. Cambridge, MA: MIT Press, 1989.

Teaiwa, Katerina. "Ruining Pacific Islands: Australia's Phosphate Imperialism." *Australian Historical Studies* 46, no. 3 (2015): 374–91.

Tsing, Anna L. *Friction: An Ethnography of Global Connection*. Princeton: Princeton University Press, 2005.

Tuhiwai Smith, Linda. *Decolonizing Methodologies: Research and Indigenous Peoples*. London: Zed, 1999.

van der Straeten, Jonas. "Review of *Let There Be Light: Engineering, Entrepreneurship and Electricity in Colonial Bengal, 1880–1945* by Suvobrata Sarkar." *Technology and Culture* 63, no. 2 (2022): 550–51.

van der Straeten, Jonas, and Heike Weber. "Technology and Its Temporalities." In *Global History of Techniques (19th–21st Centuries)*, edited by Guillaume Carnino, Liliane Hilaire-Pérez, and Jérôme Lamy, 261–80. Turnhout: Brepols, 2024.

van der Vleuten, Erik. "Alternatives to Scientific Extractivism." Alternatives2Extractivism (blog), May 3, 2023, https://alternatives2extractivism .wordpress.com/2023/05/03/alternatives-to-scientific-extractivism/.

van der Vleuten, Erik. "History and Technology in an Age of 'Grand Challenges': Raising Questions." *Technology and Culture* 61, no. 1 (2020): 260–71.

van der Vleuten, Erik. "Pluralizing 'Eurocentric' Technology Discourses 'Back Home': Technology and Societal Challenges in Western Europe." In *Global History of Techniques (19th–21st Centuries)*, edited by Guillaume Carnino, Liliane Hilaire-Pérez, and Jérôme Lamy, 179–92. Turnhout: Brepols, 2024.

van der Vleuten, Erik. "Technology, Societal Challenges, and Global Sustainability History." *ICON: Journal of the International Committee for the History of Technology* 24 (2018): 34–52.

van der Vleuten, Erik. "Transnational, Transformative, and Transdisciplinary Histories of Socio-Material-Ecological Change." In *Les techniques ont-elles une patrie? Retour sur le nationalisme et l'ethnocentrisme dans l'histoire des techniques*, edited by Marcos Camolezi, Guillaume Carnino, Liliane Hilaire-Pérez, Jérôme Lamy, and Anaël Marrec. Paris: Presses des Mines, forthcoming.

van der Vleuten, Erik, and Evelien de Hoop. "Crisis Narratives from the Dutch Soyacene: Regional Sustainability Hi/stories at Sites of Soy Consumption."

In *The Age of the Soybean: An Environmental History of Soy During the Great Acceleration*, edited by Claiton da Silva and Claudio de Majo, 265–88. Cambridge: White Horse Press, 2022.

Vries, Peer. "The Prospects of Global History: Personal Reflections of an Old Believer." *International Review of Social History* 64, no. 1 (2019): 111–21.

Wenzlhuemer, Roland. *Doing Global History: An Introduction in 6 Concepts*. London: Bloomsbury Publishing, 2019.

Zuiderent-Jerak, Teun. *Situated Intervention*: *Sociological Experiments in Health Care*. Cambridge, MA: MIT Press, 2015.