



# **Bibliography for an Antiracist History of Technology**

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# Introduction

How can we approach the history of technology from an anti-racist perspective? What does centering Black, brown, and Indigenous technological actors teach us about concepts such as innovation, ingenuity, or skill? How can an anti-racist approach help us rethink not just the cases we study, but also our broad understandings of technology's histories?

This bibliography offers alternatives to histories of technology that center white, Euro-American progress and ingenuity as foundational to the field. It is divided into three sections. The first includes scholars who are often cited in the context of antiracist histories of science and technology. The second consists of scholarship specifically focused on Black and Indigenous histories of technology. Finally, the third is focused on decentering 'the west.'

This project stems from a bibliography crowdsourced by SHOT in 2020 in response to the extrajudicial killing of George Floyd. The original crowdsourced list can be accessed [here](#). Donna Drucker (Columbia University) helped with getting started. This revision was commissioned by SHOT's committee on Racial Equity, Diversity, and Inclusion (REDI) and supported by the University of Toronto's Institute for the History of Science and Technology, under the direction of Edward Jones Imhotep. Please note that both lowercase and uppercase references to Black have been maintained to reflect the different conventions in use when the texts listed here were written.

The bibliography is meant to be generative, not exhaustive. We hope to treat it as a living document, and welcome volunteers interested in offering periodic updates.

Other good sources for antiracist work on the history of technology can be found at:

- ISIS Critical Bibliography: <https://isiscb.org/>
- History of Science Society Land Acknowledgement special interest group bibliography of works by Indigenous scholars: <https://docs.google.com/document/d/11SLRNrAKLJnyjnWAUvgDuJ-0Msij3E117kldnxOg1MY/edit>

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# 1: Anti-Racist Methods for History of Technology

- Benjamin, Ruha. *Race after Technology: Abolitionist Tools for the New Jim Code*. Cambridge, UK: Polity Press, 2019.

Building on work by Wendy Chun (below) and Beth Coleman, Benjamin's book is part of a growing body of work that discusses race as a technology. The emerging field of *race-critical code studies* critiques racism as a historically created ideological and technological system with a past and a predictive future. Focusing on digital technology, Benjamin reveals a "New Jim Code" which, like the social production of race, is hidden from view and projects an illusion of neutrality. This makes it difficult to decipher the role of digital tech in "amplifying hierarchies" and "replicating social divisions". (106) Through chapters such as "Default Discrimination," "Coded Exposure," and "Technological Benevolence," Benjamin invites the reader to see "discriminatory practices as being...deeply embedded within the sociotechnical infrastructure of everyday life." (34) Her final chapter, "Retooling Solidarity..." provides the reader with tools for the work of "Reimagining Justice" in an online world.

- Benjamin, Ruha. *Captivating Technology: Race, Carceral Technoscience, and Liberatory Imagination in Everyday Life*. Duke University Press, 2019.

The contributors to this collection of essays examine how carceral technologies such as electronic ankle monitors and predictive-policing algorithms are deployed to classify and coerce specific populations, and whether these innovations can be appropriated and reimagined for more liberatory ends. Reviewer Susila Gurusami describes the collection as "a text that excavates suppressed histories just as much as it works towards building new futures...we are at once made aware of how technologies are crafted as racialized, gendered, and classed tools of hegemony to subjugate marginalized groups to enclosure, containment, and punishment, while also directed towards the ways that technologies serve as tools to preserve, remember, and archive resistance and liberatory strategies for insurgent groups." (Gurusami, *Surveillance and Society*, 2020)

- Bhimull, Chandra, Gabrielle Hecht, Edward Jones-Imhotep, Chakanetsa Mavhunga, Lisa Nakamura, and Asif Siddiqi. "Systemic and Epistemic Racism in the History of Technology." *Technology and Culture* 63, no. 4 (2022): 935–52.

Part of a series of Presidential Panels at SHOT's virtual annual meeting in November 2021. Their aim was to further identify racism and racial thinking in SHOT, among the institutions that employ its members, and within the intellectual infrastructures of the field and of science and technology studies more broadly.

- Browne, Simone. *Dark Matters: on the Surveillance of Blackness*. Durham: Duke University Press, 2015.

Browne's book shows how surveillance practices have come to be formed through a long history of creating the conditions of blackness, a site in which surveillance is both enacted and resisted. She does this by placing surveillance studies in conversation with "the archive of enslavement and its afterlife, and drawing from Black feminist theory,

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sociology and cultural studies." (*Journal of Pan African Studies*, 2015) Reviewer Zoltan Glück describes *Dark Matters* as demonstrating how blackness has played a central role in structuring the institutions and practices of security, from the slave ships, auction blocks and plantations, which "prefigure Bentham's design of the Panopticon and the seventeenth and eighteenth-century disciplinary institutions' (42), to contemporary biometric technologies. *Dark Matters* is an important intervention in the fields of security and surveillance studies, and a beautifully crafted work of social and cultural theory that develops a new vocabulary for thinking about blackness and power in the contemporary world".

- Chun, Wendy H. K. (2012): "Race and/as Technology, or How to Do Things to Race." In: Lisa Nakamura and Peter Chow-White (eds.), *Race After the Internet*, London: Routledge, pp. 38-60.

"This essay poses the questions: to what degree are race and technology intertwined? To what extent can race be considered a technology and mode of mediatization, that is, not only a mechanism, but also a practical or industrial art? Could "race" be not simply an object of representation and portrayal, of knowledge or truth, but also a technique that one uses, even as one is used by it—a carefully crafted, historically inflected system of tools, of mediation, or of "enframing" that builds history and identity?" (article abstract)

- De la Peña, Carolyn. "The History of Technology, the Resistance of Archives, and the Whiteness of Race." *Technology and Culture* 51, no. 4 (2010): 919–37.

"De la Peña discusses the relation between race and technology and the importance of race in technology's history. She stresses that scholars have authored multiple volumes that attest to the importance of race in technology's history and this foundational scholarship illuminates the gains associated with meticulously combing archives, and locating alternative archives, for the ways in which people of color have influenced the innovation, production, and consumption of technologies in the US. By drawing out possibilities and working creatively within the cultural contexts of history, she expresses that historians of technology can begin to produce the imperfect, unfinished, and essential work on race and technology that remains to be done. In addition, she emphasizes that putting race into plain view in the history of technology requires more than a stated commitment, a well-intentioned designated panel or even a new volume on whiteness and technologies; it requires a strong, ongoing commitment to view the history of technology and the subjects that comprise it through new eyes." (article abstract)

- De la Peña, Carolyn. "'Bleaching the Ethiopian': Desegregating Race and Technology through Early X-Ray Experiments." *Technology and Culture* 47, no. 1 (2006): 27–55.

"A series of sensational stories claiming that the use of X-rays and radium could bleach even the darkest skin were published for four months prior to 1904 after which they died down. The reason why tales of turning black skin into white remain unexplored by scholars of race and technological history could be because of the positioning

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of race and technology as 'segregated subjects', revealing that the degree to which technologies are accepted depends partly on the ability to reject the threats they pose to cultural truths." (article abstract).

- Eglash, Ron. "Broken Metaphor: The Master-Slave Analogy in Technical Literature", *Technology and Culture* (2007): 360–369.

The use of the term "master-slave" is currently quite common in technical descriptions of control relation between two devices: automotive clutch and brake systems (master cylinder, slave cylinder), clocks, flip-flop circuits, computer drives, radio transmitters, and others. This essay describes the history of its technical use, dating from its origin in 1904, and the various relations between its technical usage and its racialized social connotations. We then examine various hypotheses for why a morally objectionable analogy became so popular, comments by African American engineers both for and against its continued usage, and some recommendations for altering its usage in the future. (article abstract)

- Eglash, Ron, and Julian Bleecker, "The Race for Cyberspace: Information Technology in the Black Diaspora," *Science as Culture* 10 (no. 3, 2001): 353–74.

"Barbara Christian's (1987) essay, 'The race for theory', analyzed the ways in which the academic competition to create a theory of black women's writing had overshadowed the potent theoretical content of the writing itself. Similarly, this essay examines how the hype over the application of new information technologies to racialized social problems has overshadowed the potent technological content of the communities themselves. Focusing on the black diaspora, we broaden the category of 'information technology' to show how traditions of coding and computation from indigenous African practices and black appropriations of Euro-American technologies have supported, resisted, and fused with the cybernetic histories of the West: a potential source for changes in reconstructing identity, social position, and access to power in communities of the black diaspora". (author's introduction).

- Felt, Ulrike, Rayvon Fouché, Clark A. Miller, and Laurel Smith-Doerr. *The Handbook of Science and Technology Studies*. Edited by Ulrike Felt, Rayvon Fouché, Clark A. Miller, and Laurel Smith-Doerr. Fourth edition. Cambridge, Massachusetts: The MIT Press, 2017.

This new edition, sponsored by the Society for Social Studies of Science, is the fourth in a series of volumes that have defined the field of STS. It features 36 chapters, each written for the fourth edition, that capture the state of the art in a rich and rapidly growing field. One especially notable development is the increasing integration of feminist, gender, and postcolonial studies into the body of STS knowledge. The book covers methods and participatory practices in STS research; mechanisms by which knowledge, people, and societies are coproduced; the design, construction, and use of material devices and infrastructures; the organization and governance of science; and STS and societal challenges including aging, agriculture, security, disasters, environmental justice, and climate change. (from the publisher's website) A chapter titled "Race and Science in the 21<sup>st</sup> Century" includes essays on early scientific racism,

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medical racism and experimentation, postwar race and human genetics, race and genomics in contemporary Biosciences, social implications of research on race, genetics and disease, genetics in identity, governance, law and forensics and the implications for STS of future studies on race and science.

- Fouché, Rayvon. "The Wretched of the Gulf: Racism, Technological Dramas, and Black Politics of Technology," *The Black Scholar* 36 (no. 4, 2006): 7–12.

Writing in the aftermath of Hurricane Katrina(2005), Fouché situates his discussion in the context of Fanon, Bhabha and other Black intellectuals' demand for "an equitable distribution of wealth and technology beyond the rhetorical pieties of 'moral reparations'"(8) Fouché argues that while discussions of black rights, justice, and power were prevalent in the wake of this disaster engineered to further erode and marginalize Black communities, discussions about technological politics and power--specifically a black politics of technology were absent. "Pushing in the direction of black technological power, questions about the racial politics of technology bubble to the surface; questions that are not only about whether or not artifacts "have politics," but questions that consider what politics artifacts support, maintain, express, and expose." (9)

- Fouché, Rayvon. "Say it Loud, I'm Black and I'm Proud': American Artifactual Culture, and Black Vernacular Creativity," *American Quarterly* 58.3 (2006): 639-661.

Fouché launches his essay in Black Power movement critiques, and touches on key moments in African American history of technology to situate his analysis in a brief critical overview of Social Construction of Technology and Actor Network Theory as approaches that have been unable to grapple with African American viewpoints in STS. He theorizes Black vernacular technological creativity as resulting from "resistance to existing technology and strategic appropriation of the material and symbolic power and energy of technology."(641) He aims to extend the concept of the Black vernacular as part of a culture of "survival technology...to describe the ways African Americans interact with material forms and affects of technology" through "redeployment, reconception and re-creation...to express multiple ways that African Americans as culturally and historically constituted subjects have engaged the material reality of technology in America." (641-642) He concludes by calling for a study of technology that alters the discourse of American technology "rather than to multiculturalize our narrow understanding of technology in America." (657)

- Hammonds, Evelyn. "New Technologies of Race." In *Processed Lives: Gender and Technology in Everyday Life*, edited by Melodie Calvert, and Jennifer Terry, 74–85. Routledge, 1997.

Evelyn Hammonds explores the technological development of computer morphing whereby bodies can be disassembled and reassembled or blended to produce a composite and normalized image that, in effect, homogenizes the human race. Morphing, then, can be read as technologically assisted integration whereby all distinct features become interchangeable. Hammonds critically reads the popular media exuberance about this technology in the context of historical debates over the definition of race, highlighting the persistent desire to ground cultural difference in visible

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features of the body. But Hammonds notes that morphing attempts to separate race from the history of anti-miscegenationist thinking and racial oppression, as if the settings could simply be eliminated through a series of keystrokes. Computer morphing provides the illusion that not only are physical forms easy to change, transport, replace, and appropriate, but so are identities and histories. (from the editors' introduction)

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

"In *Residual Governance*, Gabrielle Hecht dives into the wastes of gold and uranium mining in South Africa to explore how communities, experts, and artists fight for infrastructural and environmental justice. Hecht outlines how mining in South Africa is a prime example of what she theorizes as residual governance—the governance of waste and discard, governance that is purposefully inefficient, and governance that treats people and places as waste and wastelands. She centers the voices of people who resist residual governance and the harms of toxic mining waste to highlight how mining's centrality to South African history reveals the links between race, capitalism, the state, and the environment. In this way, Hecht shows how the history of mining in South Africa and the resistance to residual governance and environmental degradation is a planetary story: the underlying logic of residual governance lies at the heart of contemporary global racial capitalism and is a major accelerant of the Anthropocene." (from publisher's website). The book centers the technopolitical nature of what Charles Mills famously called the 'racial contract' of liberal democracies. As Hecht notes, "white supremacy is built into material infrastructures, which then strengthen and propagate racial inequality."

- Hecht, Gabrielle, and Paul N. Edwards, "History and the Technopolitics of Identity: The Case of Apartheid South Africa," *Journal of Southern African Studies* 36:3 (September 2010): 619-639.

This article explores the history of nuclear systems and computers in apartheid South Africa, considering these systems – and apartheid more generally – as forms of 'technopolitics', hybrids of technical systems and political practices that produced new forms of power and agency. Both systems were exceptionally important to the apartheid state, not only as tools but also as symbols. Equally significant, both came to serve as focal points for Western governments and international anti-apartheid activists, who fought to limit South Africa's access to these systems. We argue that nuclear systems enacted the technopolitics of national identity, while computers expressed a technopolitics of social identity. (article abstract)

- Herzig, Rebecca. "Race in Histories of American Technology." In *Technology and the African- American Experience*, edited by Bruce Sinclair, 155–70. Cambridge: MIT Press, 2004.

"A series of sensational stories claiming that the use of X-rays and radium could bleach even the darkest skin were published for four months prior to 1904 after which they died down. The reason why tales of turning black skin into white remain unexplored by scholars of race and technological history could be because of the positioning



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of race and technology as 'segregated subjects', revealing that the degree to which technologies are accepted depends partly on the ability to reject the threats they pose to cultural truths." (article abstract)

- Jones-Imhotep, Edward. "The Ghost Factories: Histories of Automata and Artificial Intelligence," *History and Technology* 36, no 1(2020): 3-29.

Jones-Imhotep reviews three books by historians of science, each of which cites major 18th and early 19th century philosophical debates surrounding the active or passive (brute) nature of automation and machines. His review invites the reader to consider the materiality and human cost of the often-racialized workers behind the development of automation as "ghosted" and hidden from view in intellectual histories of science and technology. Jones-Imhotep speculates on the costs of this erasure, asking if "the most powerful and lasting effect [of these machines] was not their place in the long-running question about agency and mechanical philosophy" but rather our "learning to see them in certain ways" (9). He argues that the failure of historians of science to historicize and critique the history of automata sustains an illusion of effortlessness and ease. The example of a race-blind discussion of Thomas Jefferson's dumb waiter, operated by enslaved African Americans is one such example. The author invites the reader to return to the ghost factory to "undo the trick automata plays" (4)

- Lerman, Nina E. "Categories of Difference, Categories of Power: Bringing Gender and Race to the History of Technology." *Technology and Culture* 51(2010): 893-918.

"Recent work bringing the "linguistic turn" to the history of technology provides one explanation for why anthracite-forged iron has easily been claimed as part of their purview, while straw bonnets and Negro cloth have rarely been placed at center stage. If the word "technology" itself, as Leo Marx has argued, functioned as a keyword for the twentieth century--a "designator of a pivotal concept in contemporary discourse," a recognizable marker of progress and complexity--then a history of that technology is likely to document the paths most clearly leading to the very systems that warranted that addition to the collective vocabulary. Among others Lerman borrows from race and gender theory--from scholars who have been exploring the constructions and negotiations of seemingly natural categories, the ways in which inclusions and exclusions can work in both obvious and subtle ways--to explore what a history of technology has meant and might mean." (article abstract)

- Mavhunga, Clapperton Chakanetsa. *What Do Science, Technology, and Innovation Mean from Africa?* Cambridge, Massachusetts: The MIT Press, 2017.

This interdisciplinary collection of essays "aims to upend both popular and scholarly assumptions that leave little space to imagine Africa as a place of technology." (Mavhunga, introduction). Mavhunga's substantial introduction argues that the history of STS in Africa should be taken out of the laboratory and out of the context of economic dependency on technological models for development imported from Europe and America. Essays in the volume examine "the epistemological foundations of African STS to challenge various positions that portray Africa negatively. The volume's multi-disciplinarity is vindicated by analytical tools from philosophy, history, archaeology,



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ecological anthropology, cultural anthropology, and policy studies. The book supports the premise that African STS should employ unique methodologies and philosophies because it stems from different historical, social, spatial, economic, and epistemological foundations.” (Adapted from reviews by Laura Twagira, Gloria Emegwali, and Frank Edward)

- McKittrick, Katherine. *Dear Science and Other Stories*. Durham: Duke University Press, 2021.

Katherine McKittrick presents here a creative and rigorous study of black and anticolonial methodologies. Drawing on black studies, studies of race, cultural geography, and black feminism as well as a mix of methods, citational practices, and theoretical frameworks, she positions black storytelling and stories as strategies of invention and collaboration. She analyzes a number of texts from intellectuals and artists ranging from Sylvia Wynter to the electronica band Drexciya to explore how narratives of imprecision and relationality interrupt knowledge systems that seek to observe, index, know, and discipline blackness. Throughout, McKittrick offers curiosity, wonder, citations, numbers, playlists, friendship, poetry, inquiry, song, grooves, and anticolonial chronologies as interdisciplinary codes that entwine with the academic form. Suggesting that black life and black livingness are, in themselves, rebellious methodologies, McKittrick imagines without totally disclosing the ways in which black intellectuals invent ways of living outside prevailing knowledge systems. (publisher’s abstract)

- Mukharji, Bihari et al., “Open Conversations: Diversifying the Discipline or Disciplining Diversity? A Roundtable Discussion on Collecting Demographic Data,” *Isis* 111 (June 2020): 310–353.

“This Open Conversations section was conceived as an opportunity to use our particular expertise and special insight as historians of science to address the ethically and logistically complex work of justice in the academy.... In the midst of bureaucratic conversations regarding the creation of a new demographic statistics collection system for submissions to the journal, it suddenly dawned on us that we, of all people, should have some better insight into the epistemologies that undergird such practices. We have real insight into both the potentials and the precarities of collecting demographic information. Why not bring together our knowledge and experience and try to gain some wisdom in addressing this problem? That it took us some time to realize that this was desirable and even necessary is not actually surprising. Despite our commitment to studying how scientific knowledge emerges from social practices and networks, we are slow to recognize the role of such institutions in our own knowledge creation. There is an urgency to do something—or at least to be seen as doing something—about diversity. Something is better than nothing, surely. Yet we forget the lessons of our own histories that very often something is much worse than nothing.” (from the introduction).

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- Nakamura, Lisa. "Indigenous Circuits: Navajo Women and the Racialization of Early Electronics Manufacture," *American Quarterly* 64 (Dec. 2013): 919–941.

According to Karen Hossfeld, by the eighties in Silicon Valley, electronic assembly had become not just women's work but women of color's work. This essay focuses on a group of women of color who are almost never associated with electronic manufacture or the digital revolution—Navajo women. The archive of visual materials that document the history and industrial strategy of Fairchild Semiconductor, the most influential and pioneering electronics company in Silicon Valley's formative years, documents their participation through visual and discursive means, albeit never in their own voices. Fairchild's internal documents, such as company newsletters, and its public ones, such as brochures, along with Bureau of Indian Affairs press releases and journalistic coverage by magazines such as *Business Week*, paint a picture of Navajo women workers as uniquely suited by temperament, culture, and gender as ideal predigital digital workers. My reading of these materials reveals how Fairchild produced a racial and cultural argument for recruiting young female workers in the electronics, and later digital device production industries, from among the Navajo population. (article abstract)

- Nakamura, Lisa. *Digitizing Race: Visual Cultures of the Internet*. Minneapolis: University of Minnesota Press, 2008.

In the nineties, neoliberalism simultaneously provided the context for the Internet's rapid uptake in the United States and discouraged public conversations about racial politics. At the same time many scholars lauded the widespread use of text-driven interfaces as a solution to the problem of racial intolerance. Today's online world is witnessing text-driven interfaces such as e-mail and instant messaging giving way to far more visually intensive and commercially driven media forms that not only reveal but showcase people's racial, ethnic, and gender identity. Lisa Nakamura uses case studies of popular yet rarely examined uses of the Internet such as pregnancy Web sites, instant messaging, and online petitions and quizzes to look at the emergence of race-, ethnic-, and gender-identified visual cultures. While popular media such as Hollywood cinema continue to depict nonwhite nonmales as passive audiences or consumers of digital media rather than as producers, Nakamura argues the contrary—that users of color and women use the Internet to vigorously articulate their own types of virtual community, avatar bodies, and racial politics. (publisher's abstract)

- Nakamura, Lisa, and Peter Chow-White. *Race after the Internet*. New York: Routledge, 2012.

"Digital media technologies like the Internet create and host the social networks, virtual worlds, online communities, and media texts where it was once thought that we would all be the same, anonymous users with infinite powers. Instead, the essays in *Race After the Internet* show us that the Internet and other computer-based technologies are complex topographies of power and privilege, made up of walled gardens, new (plat)forms of economic and technological exclusion, and both new and old styles of race as code, interaction, and image. Investigating how racialization and racism are changing in web 2.0 digital media culture, *Race After the Internet* contains

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interdisciplinary essays on the shifting terrain of racial identity and its connections to digital media, including Facebook and MySpace, YouTube and viral video, WiFi infrastructure, the One Laptop Per Child (OLPC) program, genetic ancestry testing, DNA databases in health and law enforcement, and popular online games like World of Warcraft. Ultimately, the collection broadens the definition of the "digital divide" to convey a more nuanced understanding of usage, meaning, participation, and production of digital media technology in light of racial inequality." (publisher's abstract)

- Nelson, Alondra., Alicia Headlam. Hines, and Thuy Linh N. Tu. *Technicolor: Race, Technology, and Everyday Life*. New York: New York University Press, 2001.

"Published in 2001, the *Technicolor* anthology was one of the first meaningful attempts to acknowledge the presence of race and ethnicity in debates on the social and cultural impacts of technology. The work explores the multifaceted ways that people of color experience the new information and communication technologies in their everyday lives. It provides a closer examination of the experiences of minority and under-represented populations in order to shed light upon the complexities surrounding technology and race operations. *Technicolor* presents a significant model in our analytic lens towards understanding the social and cultural connections between technology and race in terms of the totality of human experiences. The collection of essays shows how race and technology function in everyday life in a realm of activities that include work and labor relations, leisure, family life and personal life. *Technicolor* moves beyond the usually adopted binary logic of positive and negative impacts of technology on race – technophilia and technophobia – to more practically appraise lived experience in a progressively more technological world." (Reviewed by Bharat Mehra in *Information, Communication and Society*, 2005)

- Nelson, Alondra. "Introduction: *Future Texts*." *Social Text* 20, no.2(71) (2002):1-15.

This article begins with an appraisal of the founding fiction of technocultural neocriticism proposing the "unequivocal novelty of identity in the digital age" (1) and science fiction ontologies in which technology catalyzes a multiple, fragmented self. Alondra then engages the work of W.E.B. Du Bois, Kalí Tal, and Lisa Nakamura among others, to reflect on his initiation in 1998 of "the list" a digital conversation from which Afrofuturism was born. This now widely known movement proposes that the "proliferation of selves in the digital age has long been the experience of African diasporic people" and that "over a century's worth of "sophisticated tools for the analysis of cyberculture" already existed in African American thought". (2)

- Noble, Safiya Umoja. *Algorithms of Oppression: How Search Engines Reinforce Racism*. New York: New York University Press, 2018

In *Algorithms of Oppression*, Safiya Umoja Noble challenges the idea that search engines like Google offer an equal playing field for all forms of ideas, identities, and activities. Data discrimination is a real social problem; Noble argues that the combination of private interests in promoting certain sites, along with the monopoly status of a relatively small number of Internet search engines, leads to a biased set of search algorithms that privilege whiteness and discriminate against people of color,

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specifically women of color. Through an analysis of textual and media searches as well as extensive research on paid online advertising, Noble exposes a culture of racism and sexism in the way discoverability is created online. An original, surprising and, at times, disturbing account of bias on the internet, *Algorithms of Oppression* contributes to our understanding of how racism is created, maintained, and disseminated in the 21st century. (publisher's abstract)

- Roberts, Dorothy E. "Reimagining Race, Resistance, and Technoscience." In *Captivating Technology*, edited by Ruha Benjamin, 328–48. Durham, NC: Duke University Press, 2019.

The contributors to *Captivating Technology* examine how carceral technologies such as electronic ankle monitors and predictive-policing algorithms are being deployed to classify and coerce specific populations and whether these innovations can be appropriated and reimagined for more liberatory ends. This chapter features Benjamin's interview with sociologist and law professor Dorothy Roberts on a wide range of topics at the intersection of technology, society and antiracism including algorithms, genetic engineering, reproductive rights and the Black feminist abolitionist movement. (article abstract)

## 2: Black and Indigenous Histories of Technology

The first five entries here are not directly related to the history of technology but are included to help frame debates about what it means to decolonize and to use the term in academic discourse.

- Achille Mbembe. 2015. "Decolonizing Knowledge and the Question of the Archive." Africa is a Country." <https://wiser.wits.ac.za/system/files/Achille%20Mbembe%20-%20Decolonizing%20Knowledge%20and%20the%20Question%20of%20the%20Archive.pdf>

This "e-book" published online by "Africa is a Country" was deliberately written as a spoken text by Achille Mbembe. It forms the basis of a series of public lectures given at the Wits Institute for Social and Economic Research (WISER), University of the Witwatersrand (Johannesburg), at conversations with the Rhodes Must Fall Movement at the University of Cape Town and the Indexing the Human Project, Department of Sociology and Anthropology at the University of Stellenbosch. According to his introduction: "the nature of the events unfolding in South Africa, the type of audience that attended the lectures, the nature of the political and intellectual questions at stake required an entirely different mode of address – one that could speak both to reason and to affect." In this text, Mbembe engages what it means to decolonize knowledge and practice in the university in relation to demythologizing whiteness, architecture, public spaces and the common, the quantified subject and deep time, among other topics. (Reviewed by Angela Okune in *Platform for Experimental Collaborative Ethnography*)

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- Bernal, Victoria. "Digitality and Decolonization: A Response to Achille Mbembe." *African Studies Review* 64, no. 1 (2021): 41–56. doi:10.1017/asr.2020.90.

This article explores questions of decolonization, in part through analyzing Belgium's Africa Museum. Bernal considers the role of academia and knowledge production, as well as the technological developments that may create new concentrations of power faster than decolonial projects can dismantle established hierarchies. She concludes that decolonization must address material questions of reparations and restitution, and that digital media have been transformative in ways that bring northern models of social existence closer to African ones. Having lived under colonizers, despots, and states of exception, Africans bring important knowledge and experience to twenty-first-century global struggles. (article abstract)

- Murphy, Michelle. "Some Keywords Toward Decolonial Methods: Studying Settler Colonial Histories and Environmental Violence From Tkaronto." *History and Theory: Studies in the Philosophy of History* 59, no. 3 (2020): 376–84.

This article provides keywords and reflections for decolonial methods, drawing on insights from the Indigenous-led Land and the Refinery project, which concerns the history of Canada's Chemical Valley. This project is crucially organized as Indigenous people co-researching the Imperial Oil Refinery, not as academics studying Aamjiwnaang, and asks how Indigenous and decolonial methods might reorient the use of archives toward other futures. Together, the keywords begin to outline a particular place-based theory of change within decolonial historical practice.

- Tuck, Eve, and K. Wayne Yang. "Decolonization Is Not a Metaphor." *Decolonization: Indigeneity, Education & Society* 1, no. 1 (2012): 1–40.

Our goal in this article is to remind readers what is unsettling about decolonization. Decolonization brings about the repatriation of Indigenous land and life; it is not a metaphor for other things we want to do to improve our societies and schools. The easy adoption of decolonizing discourse by educational advocacy and scholarship, evidenced by the increasing number of calls to "decolonize our schools," or "decolonizing methods," or "decolonize student thinking", turns decolonization into a metaphor. As important as their goals may be, social justice, critical methodologies, or approaches that decenter settler perspectives have objectives that may be incommensurable with decolonization. Because settler colonialism is built upon an entangled triad structure of settler-native-slave, the decolonial desires of white, nonwhite, immigrant, postcolonial, and oppressed people, can similarly be entangled in resettlement, reoccupation, and reinhabitation that furthers settler colonialism. The metaphorization of decolonization makes possible a set of evasions, or "settler moves to innocence", that problematically attempt to reconcile settler guilt and complicity, and rescue settler futurity. In this article, we analyze multiple settler moves towards innocence in order to forward "an ethic of incommensurability" that recognizes what is distinct and what is sovereign for project(s) of decolonization in relation to human and civil rights based social justice projects. We also point to unsettling themes within transnational/Third World decolonizations, abolition, and critical space place pedagogies, which challenge the

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coalescence of social justice endeavors, making room for more meaningful potential alliances (article abstract)

- Todd, Z. (2016) An Indigenous Feminist's Take On The Ontological Turn: 'Ontology' Is Just Another Word For Colonialism. *Journal of Historical Sociology*, 29: 4–22.

In this article, I ask how anthropology can adopt a decolonial approach that incorporates and acknowledges the critical scholarship of Indigenous thinkers whose work and labour informs many current trends in Euro-Western scholarship, activism and socio-political discourse. I also query how to address ongoing structural colonialism within the academy in order to ensure that marginalised voices are heard within academic discourses. I wrote a blog post on the Ontological Turn and citational praxis that went viral— I have now expanded on that post and incorporated material that further elaborates my relationship to turns of thought in anthropology, and the British academy, as an Indigenous feminist (Red River Métis, Otipemisiwak) woman from amiskwaciwâskahikan (Edmonton, Alberta, Canada). (article abstract)

- Abbate, Janet, and Stephanie Dick, eds. *Abstractions and Embodiments : New Histories of Computing and Society*. Baltimore: Johns Hopkins University Press, 2022.

The essays in the volume are divided into two sections, entitled “Abstractions” and “Embodiments.” This binary and others like it, between mind and body, ideas and materiality, hardware and software, serve as a guiding through line for the essays in the volume and as a historiographic intervention. According to the editors, focusing on the ongoing construction of these binaries offers one solution to perhaps the deepest problem facing computer history, namely, what is it a history of? Historians, the editors suggest, should neither take these binaries for granted nor dismiss them altogether. Rather, historians of computing, they suggest, should attend directly to the construction of these binaries. As they write, “the question of who has a mind and who has a body—who will be remembered for their ideas and who will be remembered for their physical labor—is always at once a historical, a technical, and a social question” (p. 11). Of particular interest for an antiracist historian are: **Kelcey Gibbons** focuses on what she terms “the invention of the Black computer professional” and organizations such as the National Urban League, which sought to democratize the labor force in the computing industry. (Alma Steingart, reviewer, *Isis*, June 2023), **Robson, Cierra**. “Broken Mirrors: Surveillance in Oakland as Both Reflection and Refraction of California’s Carceral State.” pp. (360-379.); **Nichols, Tiffany**, “Patenting Automation of Race and Ethnicity Classifications Protecting Neutral Technology or Disparate Treatment by Proxy?” pp. (102-125)

- Braun, Lundy. *Breathing Race into the Machine: The Surprising Career of the Spirometer from Plantation to Genetics*. Minneapolis: University of Minnesota Press, 2014.

In the antebellum South, plantation physicians used a new medical device—the spirometer—to show that lung volume and therefore vital capacity were supposedly less in black slaves than in white citizens. At the end of the Civil War, a large study of racial



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difference employing the spirometer appeared to confirm the finding, which was then applied to argue that slaves were unfit for freedom. What is astonishing is that this example of racial thinking is anything but a historical relic. In *Breathing Race into the Machine*, science studies scholar Lundy Braun traces the little-known history of the spirometer to reveal the social and scientific processes by which medical instruments have worked to naturalize racial and ethnic differences, from Victorian Britain to today. Routinely a factor in clinical diagnoses, preemployment physicals, and disability estimates, spirometers are often “race corrected,” typically reducing normal values for African Americans by 15 percent. An unsettling account of the pernicious effects of racial thinking that divides people along genetic lines, *Breathing Race into the Machine* helps us understand how race enters science and shapes medical research and practice. (publisher’s abstract)

- André Brock, Jr., *Distributed Blackness: African American Cybercultures* (New York: New York University Press, 2020)

"An explanation of the digital practices of the black Internet From Black Planet to #BlackGirlMagic, *Distributed Blackness* places blackness at the very center of internet culture. André Brock Jr. claims issues of race and ethnicity as inextricable from and formative of contemporary digital culture in the United States. *Distributed Blackness* analyzes a host of platforms and practices (from Black Twitter to Instagram, YouTube, and app development) to trace how digital media have reconfigured the meanings and performances of African American identity. Brock moves beyond widely circulated deficit models of respectability, bringing together discourse analysis with a close reading of technological interfaces to develop nuanced arguments about how "blackness" gets worked out in various technological domains. As Brock demonstrates, there's nothing niche or subcultural about expressions of blackness on social media: internet use and practice now set the terms for what constitutes normative participation. Drawing on critical race theory, linguistics, rhetoric, information studies, and science and technology studies, Brock tabs between black-dominated technologies, websites, and social media to build a set of black beliefs about technology. In explaining black relationships with and alongside technology, Brock centers the unique joy and sense of community in being black online now." (publisher’s abstract).

- Broussard, Meredith. *Artificial Unintelligence: How Computers Misunderstand the World* (Cambridge, MA: MIT Press, 2018)

"In *Artificial Unintelligence*, Meredith Broussard argues that our collective enthusiasm for applying computer technology to every aspect of life has resulted in a tremendous amount of poorly designed systems. We are so eager to do everything digitally—hiring, driving, paying bills, even choosing romantic partners—that we have stopped demanding that our technology actually work. Broussard, a software developer, and journalist, reminds us that there are fundamental limits to what we can (and should) do with technology. With this book, she offers a guide to understanding the inner workings and outer limits of technology—and issues a warning that we should never assume that computers always get things right. Making a case against techno chauvinism—the belief that technology is always the solution—Broussard argues that it's just not true that



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social problems would inevitably retreat before a digitally enabled Utopia. To prove her point, she undertakes a series of adventures in computer programming. She goes for an alarming ride in a driverless car, concluding "the cyborg future is not coming any time soon"; uses artificial intelligence to investigate why students can't pass standardized tests; deploys machine learning to predict which passengers survived the Titanic disaster; and attempts to repair the U.S. campaign finance system by building AI software. If we understand the limits of what we can do with technology, Broussard tells us, we can make better choices about what we should do with it to make the world better for everyone." (publisher's abstract). **Winner of SHOT's 2019 Sally Hacker Book prize.**

- Broussard, Meredith. *More Than a Glitch, Confronting Race, Gender and Ability Bias in Tech* (Cambridge, MA: MIT Press, 2023)

The word "glitch" implies an incidental error, as easy to patch up as it is to identify. But what if racism, sexism, and ableism aren't just bugs in mostly functional machinery—what if they're coded into the system itself? In the vein of heavy hitters such as Safiya Umoja Noble, Cathy O'Neil, and Ruha Benjamin, Meredith Broussard demonstrates in *More Than a Glitch* how neutrality in tech is a myth and why algorithms need to be held accountable. Broussard, a data scientist and one of the few Black female researchers in artificial intelligence, synthesizes concepts from computer science and sociology. She explores a range of examples: from facial recognition technology trained only to recognize lighter skin tones, to mortgage-approval algorithms that encourage discriminatory lending, to the dangerous feedback loops that arise when medical diagnostic algorithms are trained on insufficiently diverse data. Even when such technologies are designed with good intentions, Broussard shows, fallible humans develop programs that can result in devastating consequences. Broussard argues that the solution isn't to make omnipresent tech more inclusive, but to root out the algorithms that target certain demographics as "other" to begin with. With sweeping implications for fields ranging from jurisprudence to medicine, the ground-breaking insights of *More Than a Glitch* are essential reading for anyone invested in building a more equitable future. (publisher's abstract)

- Bulstrode, Jenny. "Black Metallurgists and the Making of the Industrial Revolution." *History and Technology* 39, no. 1 (2023): 1–41.

Metallurgy is the art and science of working metals, separating them from other substances and removing impurities. This paper is concerned with the Black metallurgists on whose art and science the intensive industries; military bases; and maritime networks of British enslaver colonialism in eighteenth-century Jamaica depended. To engage with these metallurgists on their own terms, the paper brings together oral histories and material culture with archives, newspapers, and published works. By focusing on the practices and priorities of Jamaica's Black metallurgists, the significance and reach of their work begins to be uncovered. Between 1783 and 1784 financier turned ironmaster, Henry Cort, patented a process of rendering scrap metal into valuable bar iron. For this 'discovery', economic and industrial histories have lauded him as one of the revolutionary makers of the modern world. This paper shows how the myth of Henry Cort must be revised with the practices and purposes of Black

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metallurgists in Jamaica, who developed one of the most important innovations of the industrial revolution for their own reasons.

- Cardon, N. "Cycling on the Color Line: Race, Technology, and Bicycle Mobilities in the Early Jim Crow South, 1887-1905." *Technology and Culture* 62, no. 4 (2021): 973–1002.

The safety bicycle arrived in the U.S. South in the middle of a transition from relative African American freedom following the Civil War to a reassertion of white hegemony in the region. This article examines how white and African American southerners interpreted the meanings and practices of the safety bicycle through a contingent spatial and mobility politics found at the intersection of race and technology. For African Americans, the bicycle was both a symbolic and real opportunity to express modern freedoms at the moment those freedoms were being curtailed. The South, however, was not the only region of the world where the politics of race shaped bicycle mobilities, and this article points to the ways the southern experience of bicycle technology mirrors but does not necessarily replicate places beyond the United States. (article abstract)

- Charles, Nicole. *Suspicion: Vaccines, Hesitancy, and the Affective Politics of Protection in Barbados*. Durham: Duke University Press, 2022.

In 2014 Barbados introduced a vaccine to prevent certain strains of the human papillomavirus (HPV) and reduce the risk of cervical cancer in young women. Despite the disproportionate burden of cervical cancer in the Caribbean, many Afro-Barbadians chose not to immunize their daughters. In *Suspicion*, Nicole Charles reframes Afro-Barbadian vaccine refusal from a question of hesitancy to one of suspicion. Drawing on ethnographic fieldwork, black feminist theory, transnational feminist studies and science and technology studies, Charles foregrounds Afro-Barbadians' gut feelings and emotions and the lingering trauma of colonial and biopolitical violence. She shows that suspicion, far from being irrational, is a fraught and generative affective orientation grounded in concrete histories of mistrust of government and coercive medical practices foisted on colonized peoples. By contextualizing suspicion within these longer cultural and political histories, Charles troubles traditional narratives of vaccine hesitancy while offering new entry points into discussions on racialized biopolitics, neocolonialism, care, affect, and biomedicine across the Black diaspora. (publisher's abstract)

- Chinn, Sarah E. *Technology and the Logic of American Racism: A Cultural History of the Body as Evidence* (London: Continuum, 2000)

In this book, Sarah E. Chinn pulls together what seems to be opposite discourses--the information-driven languages of law and medicine and the subjective logics of racism--to examine how racial identity has been constructed in the United States over the past century. She examines a range of primary social case studies such as the American Red Cross' lamentable decision to segregate the blood of black and white donors during World War II, and its ramifications for American culture, and other examples that reveal the racist nature of criminology, such as the trial of O.J. Simpson. Among several key American literary texts, she looks at Mark Twain's *Pudd'nhead Wilson*, a novel whose plot turns on issues of racial identity and which was written at a time when scientific

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and popular interest in evidence of the body, such as fingerprinting, was at a peak. (publisher's abstract)

- D'Avignon, Robyn. *A Ritual Geology: Gold and Subterranean Knowledge in Savannah West Africa*. Durham: Duke University Press, 2022.

Set against the ongoing corporate enclosure of West Africa's goldfields, *A Ritual Geology* tells the untold history of one of the world's oldest indigenous gold mining industries: Francophone West Africa's *orpaillage*. Establishing African miners as producers of subterranean knowledge, Robyn d'Avignon uncovers a dynamic "ritual geology" of techniques and cosmological engagements with the earth developed by agrarian residents of gold-bearing rocks in savanna West Africa. Colonial and corporate exploration geology in the region was built upon the ritual knowledge, gold discoveries, and skilled labor of African miners even as states racialized African mining as archaic, criminal, and pagan. Spanning the medieval and imperial past to the postcolonial present, d'Avignon weaves together long-term ethnographic and oral historical work in southeastern Senegal with archival and archeological evidence from Burkina Faso, Côte d'Ivoire, Guinea, and Mali. *A Ritual Geology* introduces transnational geological formations as a new regional framework for African studies, environmental history, and anthropology. (publisher's abstract)

- Duarte, Marisa Elena. *Network Sovereignty: Building the Internet across Indian Country*. Seattle: University of Washington Press, 2017.

"The histories of information and communication technologies (ICTs) are intertwined with U.S. histories of colonization, and the sovereignty and self-determination of Native peoples. This book examines case studies of tribal governments building out broadband infrastructures--the infrastructures that undergird uses of ICTs such as mobile phones, computers, databases, and streaming radio--to reveal how the processes of network design and deployment embed these information and communication infrastructures within the ongoing exercise of tribal sovereignty in the U.S." (publisher's abstract)

- Fields-Black, Edda L. *Deep Roots: Rice Farmers in West Africa and the African Diaspora*. Bloomington: Indiana University Press, 2008.

In this book, Fields-Black uses a unique blend of interdisciplinary sources and methods to chronicle the development of tidal rice-growing technology by the inhabitants of the West African Rice Coast region, the region where the majority of captives disembarking in South Carolina and Georgia originated. By integrating linguistic evidence, biological and botanical studies of mangrove ecosystems, oral traditions, and travelers' accounts from the first European traders to visit the coastal region, *Deep Roots* reconstructs a historical period pre-dating the first written sources for the region and beginning more than a millennium before the trans-Atlantic slave trade when both West African rice and rice farmers became important commodities. This is the first study to apply the comparative method of historical linguistics to the Atlantic languages of West Africa's coast. The narrative reveals the development of highly specialized and intensely localized agricultural technology and identities indigenous to West Africa's coastal littoral. It presents a rare picture of dynamic early coastal West African societies, challenging Africanists' assumptions that rice-growing technology diffused from the

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interior to the coast. A picture of a dynamic, diverse, highly specialized, and localized pre-colonial Africa also stands in sharp contrast to Americanists' constructions of a static, undifferentiated pre-modern Africa which acted as the progenitor of cultures in the African Diaspora. (Faculty page, Carnegie-Mellon University)

- Fouché, Rayvon. *Black Inventors in the Age of Segregation: Granville T. Woods, Lewis H. Latimer & Shelby J. Davidson*. Baltimore: The Johns Hopkins University Press, 2003.

In this study Fouché examines the everyday lives and work of three African American inventors: Granville Woods (1856-1910), an independent inventor; Lewis Latimer (1848-1928), a corporate engineer with GE; and Shelby Davidson (1868-1930), who worked in the U.S. Treasury Department. "Fouché maintains that four tenets have contributed to a limited understanding that patents equal financial success, that black inventors invented purely to uplift the race, that an object or process patented by a black person is the first of its kind, and that racism affected the lives of black inventors in the same way" (Reviewed by Robert Hayden in *Journal of African American History*, 2004)

- Gibbons, Kelcey. "Inventing the Black Computer Professional." In Abbate, Janet, and Stephanie Dick, eds. *Abstractions and Embodiments: New Histories of Computing and Society* Baltimore: Johns Hopkins University Press, 2022, pp. 257-276. (see Abbate, *Abstractions and Embodiments*)
- Green, Venus. *Race on the Line: Gender, Labor, and Technology in the Bell System, 1880-1980* (Durham, NC: Duke University Press, 2001)

*Race on the Line* is the first book to address the convergence of race, gender, and technology in the telephone industry. Venus Green—a former Bell System employee and current labor historian—presents a hundred-year history of telephone operators and their work processes, from the invention of the telephone in 1876 to the period immediately before the break-up of the American Telephone and Telegraph Company in 1984. Green shows how, as technology changed from a manual process to a computerized one, sexual and racial stereotypes enabled management to manipulate both the workers and the workplace. *Race on the Line* combines oral history, personal experience, and archival research to weave a complicated history of how skill is constructed and how its meanings change within a rapidly expanding industry. Green discusses how women faced an environment where male union leaders displayed economic as well as gender biases and where racism served as a persistent system of division. Separated into chronological sections, the study moves from the early years when the Bell company gave both male and female workers opportunities to advance; to the era of the "white lady" image of the company, when African American women were excluded from the industry and feminist working-class consciousness among white women was consequently inhibited; to the computer era, a time when black women had waged a successful struggle to integrate the telephone operating system but faced technological displacement and unrewarding work. (publisher's abstract)

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- Harrison, Conor. "Extending the 'White Way': Municipal Streetlighting and Race, 1900–1930." *Social & Cultural Geography* 16, no. 8 (2015): 950–73.

While the illumination of streets by electric streetlights in Western cities is a given today, in the early part of the twentieth century it was a technology whose conspicuous consumption was a status symbol for both individuals and towns. Not long after its introduction, however, electric lighting in cities also became noticeable in its absence. This paper draws on municipal records to consider how ideologies of white supremacy and progress came together to produce the uneven deployment of streetlighting in the small town of Rocky Mount, North Carolina, thus contributing to the city's segregation in the early part of the twentieth century. By tracing the development of hierarchical streetlighting systems, such as General Electric's White Way, I also show how the racialized deployment of streetlighting was aided by large electrical equipment manufacturers. In conclusion, I argue that these insights are crucial to understanding how technologies racialize space, but also how technologies such as streetlighting are central to the production of the spaces in which race is produced and racism takes place. (article abstract)

- Hobart, Hi'ilei Julia Kawehipuaakahaopulani. 2016. "Snowy Mountaineers and Soda Waters: Honolulu and Its Age of Ice Importation." *Food, Culture & Society* 19 (3): 461–83.

In 1850, Honolulu received its first shipment of cold, clear ice for public sale. Used to chill cocktails and other refreshments, comestible coldness underwent a process of intense meaning-making that reflected the discourses concerning race and civility that played out across Hawai'i's growing urban environment. This article analyzes the political and social dimensions of ice's introduction to Honolulu to show how taste, and particularly the taste for coldness, emerged from, responded to, and pushed back against a burgeoning American settler colonial project. It shows that before coldness became so unremarkably common in Hawai'i, a place where water freezes only atop its three tallest mountain peaks during the coldest months of the year, the early introduction of ice cut across the deeply moralized and highly politicized foodscape of mid-nineteenth century Hawai'i. (article abstract)

- Hobart, Hi'ilei Julia Kawehipuaakahaopulani, and Stephanie Maroney. 2019. "On Racial Constitutions and Digestive Therapeutics." *Food, Culture & Society* 22 (5): 576–94. Lonetree, Amy. 2012. Chapel Hill: The University of North Carolina Press.

This dialogic piece includes two case studies examining how racial difference figures in digestion, health, and assimilation through the digestive tract. Each study - of Taroena and fecal microbiota transplants - involves turning once undesirable/object substances into therapeutic health products and promissory futures. Both essays explore the extractive nature of colonial encounters - of locating resources (foodstuffs or fecal matter) in Indigenous bodies and culture for the purpose of nourishing the colonizer - and revealing the discursive and technoscientific work required for such a task. The authors demonstrate the need for scholars of critical food and nutrition studies to reckon with the constitutively colonial manner in which dietary products, therapeutics, and ideals link "natural" or "ancient" foods to Indigenous lands and bodies. (article abstract)

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- Lakwete, Angela. *Inventing the Cotton Gin: Machine and Myth in Antebellum America*. Baltimore: Johns Hopkins University Press, 2003.

"The cotton gin animates the American imagination in unique ways. It evokes no images of antique machinery or fluffy fiber but rather scenes of victimized slaves and battlefield dead. It provokes the suspicion that had Eli Whitney never invented the gin, United States history would have been somehow different. Yet cotton gins existed for centuries before Whitney invented his gin in 1794. In *Inventing the Cotton Gin*, Lakwete explores the history of the cotton gin as an aspect of global history and an artifact of southern industrial development. She examines gin invention and innovation in Asia and Africa from the earliest evidence to the seventeenth century, when British colonizers introduced an Asian hand-cranked roller gin to the Americas. Lakwete shows how indentured British, and later enslaved Africans, built and used foot-powered models to process the cotton they grew for export. After Eli Whitney patented his wire-toothed gin, southern mechanics transformed it into the saw gin, offering stiff competition to northern manufacturers. Far from being a record of southern failure, Lakwete concludes, the cotton gin—correctly understood—supplies evidence that the slave labor-based antebellum South innovated, industrialized, and modernized. (publisher's abstract) **Winner of the 2004 Edelstein Prize given by the Society for the History of Technology.**

- Luby, Brittany. 2015. "From Milk-Medicine To Public (Re)Education Programs: An Examination Of Anishinabek Mothers' Responses To Hydroelectric Flooding In The Treaty #3 District, 1900-1975." *Canadian Bulletin of Medical* 32 (2): 363-89.

This paper explores how Anishinabek women managed their households during the hydroelectric boom of the 1950s and provides new insight into flooding impact analyses. To date, historians have sought to understand how hydroelectric development compromised "subsistence" living. Research has addressed declining fish and game populations and the corresponding decline in male employment. But what do these trends mean once the nets and traps have been emptied? By focusing on the family home, we discover that hydroelectric power generation on the Winnipeg River disrupted the environment's ability to provide resources necessary to maintain women's reproductive health (especially breast milk). Food shortages caused by hydroelectric development in the postwar era compromised Anishinabek women's ability to raise their children in accordance with cultural expectations. What emerges from this analysis is a new lens through which to theorize the voluntary enrolment of Anishinabek children in residential schools in northwestern Ontario. (article abstract)

- McIlwain, Charlton D. *Black Software: The Internet and Racial Justice, from the AfroNet to Black Lives Matter* (Oxford University Press, 2020)

Beginning with the simultaneous rise of civil rights and computer revolutions in the 1960s, McIlwain, for the first time, chronicles the long relationship between African Americans, computing technology, and the Internet. In turn, he argues that the forgotten figures who worked to make black politics central to the Internet's birth and evolution paved the way for today's explosion of racial justice activism. From the 1960s to present, the book examines how computing technology has been used to neutralize the threat that black people pose to the existing racial order, but also how black people



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seized these new computing tools to build community, wealth, and wage a war for racial justice. Through archival sources and the voices of many of those who lived and made this history, *Black Software* centralizes African Americans' role in the Internet's creation and evolution, illuminating both the limits and possibilities for using digital technology to push for racial justice in the United States and across the globe. (publisher's abstract)

- Minh-ha T. Pham, "Visualizing the 'MisFit': Virtual Fitting Rooms and the Politics of Technology," *American Quarterly* 67 (March 2015): 165–

This essay investigates the cultural and technological logics underpinning the design and operations of virtual fitting rooms. Virtual fitting rooms are full body-scanning technologies that look and function much the same as airport security scanners but, unlike their security counterparts, have been widely embraced by consumers. Virtual fitting rooms represent the latest technology in the fashion retail environment; at the same time, they are fundamentally connected to the expansion of surveillance culture in the United States. Analyzing the scientific discourse and methods that engineers and researchers employ to establish "the perfect fit" or the optimal "relation between the individual body and the particular garment," this essay argues that the scientization of style both establishes and obscures the racial ideologies underlying judgments about fashionability. From hoodies to burqas to sagging jeans and "hoochie" dresses, the "bad fit" has historically marked racialized others as "misfits" who warrant heightened scrutiny, suspicion, surveillance, and discipline. Virtual fitting rooms rationalize and systemize these long-held cultural notions under the cover of technological color blindness. (article abstract)

- Nichols, Tiffany, "Patenting Automation of Race and Ethnicity Classifications Protecting Neutral Technology or Disparate Treatment by Proxy?" In Abbate, Janet, and Stephanie Dick, eds. *Abstractions and Embodiments: New Histories of Computing and Society* Baltimore: Johns Hopkins University Press, 2022, pp. 102-125. (see Abbate, *Abstractions and Embodiments*)
- Odom, Brian C., and Stephen P. Waring, eds. *NASA and the Long Civil Rights Movement*. Gainesville, Florida: University Press of Florida, 2022.

*NASA and the Long Civil Rights Movement* is a collection that explores the complex, intertwined histories of US space exploration and the fight for Black freedom...The book expertly depicts the roles of the agency and the federal government as active participants in the displacement and erasure of Black Americans under the guise of advancing humankind...While evincing the symbiotic histories of NASA and the Civil Rights Movement, the work predictably focuses on the contributions of male scientists, politicians, and activists. Mentions of Katherine Johnson and Valentina Tereshkova are scattered throughout the anthology, but serious conversations exploring Black women's contributions are saved for the last chapters. Taken together, the essays in *NASA* successfully argue that ongoing interactions with civil rights leaders and activists encouraged NASA to reconsider its racist policies during the long Civil Rights Movement and exposes a missed opportunity to include Black women in the histories of the Civil Rights Movement and NASA. To their credit, the authors cover an expansive



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number of topics. Those interested in the effects of the Civil Rights Movement upon NASA's policies, specifically in the South, should begin with this anthology. (Reviewed by Alysa Cole in *The Journal of African American History*, 2022)

- Össbo, Åsa and Lantto, Patrik. "Colonial Tutelage and Industrial Colonialism: reindeer husbandry and early 20th-century hydroelectric development in Sweden", *Scandinavian Journal of History*, 36:3, (2011): 324-348.

The incentives for large-scale hydropower development in Sweden are usually explained in terms of the early 20th-century belief in progress and the need for energy to fuel industrialization and modernization. For reindeer husbandry, the consequences and cumulative effects of this large-scale landscape conversion, and the societal changes it entailed are still largely a story to be told as impacts and effects constantly evolve in the socio-ecological system of the reindeer grazing lands. This article investigates hydropower development in the northern parts of Sweden, and how the reindeer husbandry of the indigenous Sami people was involved, through a case study of three hydropower projects in the early 20th century. An additional perspective is illuminated: how early hydroelectric development in the reindeer grazing areas was made possible through an immersed colonialism. (article abstract)

- Osseo-Asare, Abena Dove Agyepoma. *Bitter Roots: The Search for Healing Plants in Africa*. Chicago: The University of Chicago Press, 2014.

For over a century, plant specialists worldwide have sought to transform healing plants in African countries into pharmaceuticals. And for equally as long, conflicts over these medicinal plants have endured, from stolen recipes and toxic tonics to unfulfilled promises of laboratory equipment and usurped personal patents. In *Bitter Roots*, Abena Dove Osseo-Asare draws on publicly available records and extensive interviews with scientists and healers in Ghana, Madagascar, and South Africa to interpret how African scientists and healers, rural communities, and drug companies—including Pfizer, Bristol-Myers Squibb, and Unilever—have sought since the 1880s to develop drugs from Africa's medicinal plants. Osseo-Asare recalls the efforts to transform six plants into pharmaceuticals: rosy periwinkle, Asiatic pennywort, grains of paradise, *Strophanthus*, *Cryptolepis*, and *Hoodia*. Through the stories of each plant, she shows that herbal medicine and pharmaceutical chemistry have simultaneous and overlapping histories that cross geographic boundaries. At the same time, Osseo-Asare sheds new light on how various interests have tried to manage the rights to these healing plants and probes the challenges associated with assigning ownership to plants and their biochemical components. A fascinating examination of the history of medicine in colonial and postcolonial Africa, *Bitter Roots* will be indispensable for scholars of Africa; historians interested in medicine, biochemistry, and society; and policy makers concerned with drug access and patent rights. (publisher's abstract)

- Osseo-Asare, Abena Dove Agyepoma. *Atomic Junction: Nuclear Power in Africa after Independence*. Cambridge, United Kingdom ;: Cambridge University Press, 2019.

After Atomic Junction, along the Haatso-Atomic Road there lies the Ghana Atomic Energy Commission, home to Africa's first nuclear programme after independence.

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Travelling along this road, Abena Dove Osseo-Asare gathers stories of conflict and compromise on an African nuclear frontier. She speaks with a generation of African scientists who became captivated with 'the atom' and studied in the Soviet Union to make nuclear physics their own. On Pluton Lane and Gamma Avenue, these scientists displaced quiet farming villages in their bid to establish a scientific metropolis, creating an epicentre for Ghana's nuclear physics community. By placing interviews with town leaders, physicists and local entrepreneurs alongside archival records, Osseo-Asare explores the impact of scientific pursuit on areas surrounding the reactor, focusing on how residents came to interpret activities on these 'Atomic Lands'. This combination of historical research, personal and ethnographic observations show how Ghanaians now stand at a crossroad, where some push to install more reactors, whilst others merely seek pipe-borne water. (publisher's abstract)

- Pursell, Carroll ed. *A Hammer in Their Hands: A Documentary History of Technology and the African American Experience* (Cambridge, MA: MIT Press, 2005)

The author-editor posits that scholars and students of the history of technology must move beyond the accomplishments of trained engineers and inventors, which have been the focus of most histories of technology. In his introduction, Purcell indicates that the materials he assembled for the book "make patently clear, enslaved Africans and African Americans have been skilled artisans-cooks and seamstresses as well as coopers and shoemakers-and engineers, inventors, 'steel-driving men', manufacturers, and internet website designers." To ignore this rich and varied historical experience is not only to distort the history of American technology, but "to reinforce racial and gender stereotypes that continue to disadvantage so many Americans." Containing eighty-four documents, this work is at the nexus of African American history in its multiple dimensions, from slavery to the Civil Rights Movement. Newspaper and magazine articles, advertisements for runaway slaves, letters, folklore, legal U.S. patents, protest pamphlets, biographical, autobiographical, and fictional excerpts, photographs, government reports, laws and statutes, and African American jokes are the primary sources used to document the technological experiences of ordinary African Americans and their achievements in many fields. The magic of this work rests in Purcell's use of documents that one would not ordinarily think of using to study the intersection of American technology and African American culture. (Reviewed by Robert C Hayden, *The Journal of African American History*, summer, 2006)

- Rijke-Epstein, Tasha, *Children of the Soil: The Power of Built Form in Urban Madagascar*. Forthcoming in October 2023 from Duke University Press.

In *Children of the Soil*, Tasha Rijke-Epstein offers an urban history of the port city of Mahajanga, Madagascar, before, during, and after colonization. Drawing on archival and ethnographic evidence, she weaves together the lives and afterlives of built spaces to show how city residents negotiated imperial encroachment, colonial rule, and global racial capitalism over two centuries. From Mahajanga's hilltop palace to the alluvial depths of its cesspools, the city's spaces were domains for ideological debates between rulers and subjects, French colonizers and indigenous Malagasy peoples, and Comorian migrants and Indian traders. In these spaces, Mahajanga's residents expressed

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competing moral theories about power over people and the land. The built world was also where varying populations reckoned with human, ancestral, and ecological pasts and laid present and future claims to urban belonging. Migrants from nearby Comoros harnessed built forms as anticipatory devices through which they sought to build their presence into the landscape and transform themselves from outsiders into "children of the soil" (*zanatany*). In tracing the centrality of Mahajanga's architecture to everyday life, Rijke-Epstein offers new ways to understand the relationship between the material world, the more-than-human realm, and the making of urban life. (publisher's abstract)

- Rofheart, Mahriana. "Fictional Technologies of Collaboration." *Technology and Culture* 61, no. 2 (2020): S158-S180.

Recent works of speculative fiction from Africa and the African Diaspora portray imaginative technologies, providing a lens through which to reconsider the concept of collaboration as it relates to African historical contexts. This article analyzes depictions of collaborative technologies in the novels *Nigerians in Space* by Deji Bryce Olukotun (2014); *The Hangman's Replacement: Sprout of Disruption* by Taona Chiveneko (2013); and *Zoo City* by Lauren Beukes (2011), emphasizing how the texts reflect upon histories of industrialization, mining, and bioprospecting in eastern and southern Africa. Analyzing these works, the article emphasizes how collaboration around technological projects may take unexpected forms, involve the supernatural, or have unanticipated effects. Technologies often emerge in spaces where unequal actors meet and intersect with unseen or unpredictable forces. Ultimately, forms of collaboration in these novels emphasize the aspects of loss and risk, as well as possibility, that emerge from technological projects in the context of histories of inequality and disenfranchisement. (article abstract)

- Saraiva, Tiago. "Black Science: Amílcar Cabral's Agricultural Survey and the Seeds of African Decolonization." *Isis* 113, no. 3 (2022): 597-609.

This essay studies the scientific practices of the African revolutionary Amílcar Cabral as Black Radical Tradition challenges to historical agency. His graphs on land use and soil erosion, produced for the Portuguese colonial administration of Guinea-Bissau in West Africa, prophesied the independence of peoples otherwise put outside of history. Cabral's graphs point to the underappreciated contribution of specific forms of knowledge to the history of decolonization and challenge the historian of science to write history of Black science. This is distinct from consoling narratives of Black people in science or traditional critical accounts of science and racism. Instead, fully engaging the Black Radical Tradition, the history of Black science foregrounds scientific practices that historically enacted Black agencies. (article abstract)

- Skinner, David, and Paul Rosen. "Opening The White Box: The Politics of Racialized Science and Technology." *Science as Culture* 10, no. 3 (2001): 285-300.

Introductory essay to a special issue in which all papers "have in common a concern with the ways in which science and technology are both implicated in racialized social divisions and are themselves racialized." The special issue focuses on work already

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being done in antiracist histories of technology and “the rich potential of race and racism as topics for social analyses of science and technology.” (290) (article abstract)

- Sinclair, Bruce (ed). *Technology and the African-American Experience: Needs and Opportunities for Study*. Cambridge, MA: MIT Press, 2004.

“Race and technology are two of the most powerful motifs in American history, but until recently they have not often been considered in relation to each other. This collection of essays examines the intersection of the two in a variety of social and technological contexts, pointing out, as the subtitle (borrowed from Brooke Hindle's classic 1966 work *Early American Technology*) puts it, the “needs and opportunities for study.” The essays challenge what editor Bruce Sinclair calls the “myth of black disingenuity”—the historical perception that black people were technically incompetent. Enslaved Africans brought with them the techniques of rice cultivation that proved so profitable to their white owners, and antebellum iron working in the South depended heavily on blacks' craft skills. The essays document the realities of black technical creativity—in catalogs of patented inventiveness, in the use of “invisible technologies” such as sea chanteys, and in the mastery of complex new technologies. But the book also explores the economic and social functions of the disingenuity myth, and therefore its persistence. African Americans often saw in new technologies a means to escape racial prejudice, but white Americans used them just as often to re-frame the boundaries of social behavior. The essays show that technologies and racialized thought are much more tightly connected than we have imagined.” (publisher’s abstract)

- Slaton, Amy. *Race, Rigor, and Selectivity in U.S. Engineering: The History of an Occupational Color Line* (Cambridge, MA: Harvard University Press, 2010)

Despite the educational and professional advances made by minorities in recent decades, African Americans remain woefully underrepresented in the fields of science, technology, mathematics, and engineering. Even at its peak, in 2000, African American representation in engineering careers reached only 5.7 percent, while blacks made up 15 percent of the U.S. population. Some forty-five years after the Civil Rights Act sought to eliminate racial differences in education and employment, what do we make of an occupational pattern that perpetually follows the lines of race? *Race, Rigor, and Selectivity in U.S. Engineering* pursues this question and its ramifications through historical case studies. Focusing on engineering programs in three settings—in Maryland, Illinois, and Texas, from the 1940s through the 1990s—**Amy E. Slaton** examines efforts to expand black opportunities in engineering as well as obstacles to those reforms. Her study reveals aspects of admissions criteria and curricular emphases that work against proportionate black involvement in many engineering programs. Slaton exposes the negative impact of conservative ideologies in engineering, and of specific institutional processes—ideas and practices that are as limiting for the field of engineering as they are for the goal of greater racial parity in the profession. (publisher’s abstract)

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- Sullivan Sorin, Gretchen. *Driving While Black: African American Travel and the Road to Civil Rights*. (New York, NY: Liveright Publishing Corporation, a division of W.W. Norton & Company, 2020).

It's hardly a secret that mobility has always been limited, if not impossible, for African Americans. Before the Civil War, masters confined their slaves to their property, while free Black people found themselves regularly stopped, questioned, and even kidnapped. Restrictions on movement before emancipation carried over, in different forms, into Reconstruction and beyond; for most of the twentieth century, many white Americans felt blithely comfortable denying their Black countrymen the right to travel freely on trains and buses. Yet it became more difficult to shackle someone who was cruising along a highway at forty-five miles per hour. In *Driving While Black*, acclaimed historian Gretchen Sorin reveals how the car--the ultimate symbol of independence and possibility--has always held particular importance for African Americans, allowing Black families to evade the many dangers presented by an entrenched racist society and to enjoy, in some measure, the freedom of the open road. She recounts the creation of a parallel, unseen world of Black motorists, who relied on travel guides, Black-only businesses, and informal communication networks to keep them safe. From coast to coast, mom-and-pop guesthouses, beauty parlors, large hotels. At the heart of Sorin's story is Victor and Alma Green's famous Green Book, a travel guide begun in 1936 that allowed Black Americans to join in that most basic American rite, the family vacation. As Sorin demonstrates, Black travel guides and Black-only businesses encouraged a new way of resisting oppression. ... At the same time, Sorin shows that the car, despite the freedoms it offered, brought Black people up against new challenges, from segregated ambulance services to unwarranted traffic stops and the racist violence that too often followed. Interwoven with Sorin's own family history and enhanced by dozens of little-known images, *Driving While Black* charts how the automobile fundamentally reshaped African American life, and opens up an entirely new view onto one of the most important issues of our time. (publisher's abstract)

- TallBear, Kim. 2017. "Beyond the Life/Not-Life Binary: A Feminist-Indigenous Reading of Cryopreservation, Interspecies Thinking, and the New Materialisms." In *Cryopolitics: Frozen Life in a Melting World*, edited by Joanna Radin and Emma Kowal, 179–202. Cambridge, Massachusetts: The MIT Press.

As the planet warms and the polar ice caps melt, naturally occurring cold is a resource of growing scarcity. At the same time, energy-intensive cooling technologies are widely used as a means of preservation. Technologies of cryopreservation support global food chains, seed and blood banks, reproductive medicine, and even the preservation of cores of glacial ice used to study climate change. In many cases, these practices of freezing life are an attempt to cheat death. Cryopreservation has contributed to the transformation of markets, regimes of governance and ethics, and the very relationship between life and death. In *Cryopolitics*, experts from anthropology, history of science, environmental humanities, and indigenous studies make clear the political and cultural consequences of extending life and deferring death by technoscientific means. The contributors examine how and why low temperatures have been harnessed to defer individual death through freezing whole human bodies; to defer nonhuman species

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death by freezing tissue from endangered animals; to defer racial death by preserving biospecimens from indigenous people; and to defer large-scale human death through pandemic preparedness. The cryopolitical lens, emphasizing the roles of temperature and time, provokes new and important questions about living and dying in the twenty-first century. (article abstract)

- Thomas, Lynn M. *Beneath the Surface: A Transnational History of Skin Lighteners*. Durham: Duke University Press, 2020.

For more than a century, skin lighteners have been a ubiquitous feature of global popular culture—embraced by consumers even as they were fiercely opposed by medical professionals, consumer health advocates, and antiracist thinkers and activists. In *Beneath the Surface*, Lynn M. Thomas constructs a transnational history of skin lighteners in South Africa and beyond. Analyzing a wide range of archival, popular culture, and oral history sources, Thomas traces the changing meanings of skin color from precolonial times to the postcolonial present. From indigenous skin-brightening practices and the rapid spread of lighteners in South African consumer culture during the 1940s and 1950s to the growth of a billion-dollar global lightener industry, Thomas shows how the use of skin lighteners and experiences of skin color have been shaped by slavery, colonialism, and segregation as well as by consumer capitalism, visual media, notions of beauty, and protest politics. In teasing out lighteners' layered history, Thomas theorizes skin as a site for antiracist struggle and lighteners as a technology of visibility that both challenges and entrenches racial and gender hierarchies. (publisher's abstract)

- Tsosie, Rebecca. 2012. "Indigenous Peoples and Epistemic Injustice: Science, Ethics, and Human Rights." *Washington Law Review* 87 (4): 1133–1201.

This Article explores the use of science as a tool of public policy and examines how science policy impacts indigenous peoples in the areas of environmental protection, public health, and repatriation. Professor Tsosie draws on Miranda Fricker's account of "epistemic injustice" to show how indigenous peoples have been harmed by the domestic legal system and the policies that guide the implementation of the law in those three arenas. Professor Tsosie argues that the theme of "discovery," which is pivotal to scientific inquiry, has governed the violation of indigenous peoples' human rights since the colonial era. Today, science policy is overtly "neutral," but it may still be utilized to the disadvantage of indigenous peoples. Drawing on international human rights law, Professor Tsosie demonstrates how public policy could shift from treating indigenous peoples as "objects" of scientific discovery to working respectfully with indigenous governments as equal participants in the creation of public policy. By incorporating human rights standards and honoring indigenous self-determination, domestic public policy can more equitably respond to indigenous peoples' distinctive experience. Similarly, scientists and scientific organizations can incorporate human rights standards into their disciplinary methods and professional codes of ethics as they respond to the ethical and legal implications of their work. (article abstract)



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- Tsosie, Rebecca. 2007. "Cultural Challenges to Biotechnology: Native American Genetic Resources and the Concept of Cultural Harm." *The Journal of Law, Medicine, and Ethics* 35 (3): 396–411.

This article examines the intercultural context of issues related to genetic research on Native peoples. In particular, the article probes the disconnect between Western and indigenous concepts of property, ownership, and privacy, and examines the harms to Native peoples that may arise from unauthorized uses of blood and tissue samples, or the information derived from such samples. The article concludes that existing legal and ethical frameworks are inadequate to address Native peoples' rights to their genetic resources and suggests an intercultural framework for accommodation based on theories of intergroup equality and fundamental human rights. (article abstract)

- Tsosie, Rebecca, and Joan L. McGregor. 2007. "Genome Justice: Genetics and Group Rights." *The Journal of Law, Medicine & Ethics* 35 (3): 352–55.

An introduction to the *Journal of Law, Medicine & Ethics*'s volume based on the 2004 conference titled "Bioethics, Genetics and Group Rights," held at Arizona State University and sponsored by the Lincoln Center for Applied Ethics. The introduction gives an overview of the conference topic and the author's papers. The accelerated rate of innovation within biotechnology and increasing importance of human genetic information has triggered complex and compelling issues for researchers, lawyers, health professionals, and bioethicists. Although biotechnology can and does hold great capacity for improvements in individual health care, genomic research on populations has increasingly inspired controversy because of the implications of such research for particular groups. The various articles within this symposium develop an understanding of the key issues that surround competing claims for ownership of human genetic materials and technological innovations derived from these materials. The contributors to this symposium maintain a commitment to identifying current scientific issues and also identifying standards for developing transformative ethical and legal frameworks to consider these issues. This symposium demonstrates that the standard frameworks for analysis within contemporary bioethics and law must be adapted to better address the emerging cultural, social, and political conflicts over the use of human genetic material. Together, the articles in this symposium provide a rich theoretical context within which to formulate new constructs of law and ethics that can inform our domestic policies in genomics research. (article abstract)

- Zylstra, Geoff D. "Whiteness, Freedom and Technology: The Racial Struggle over Philadelphia's Streetcars, 1859-1867," *Technology and Culture* 52 (no. 4, 2011): 678-702

Zylstra narrates black and white struggles over streetcar ridership in Civil War-era Philadelphia. He further adds to the young but growing study of race in the history of technology by showing how streetcars were enrolled in producing racialized users, practices, and spaces. (article abstract)



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### 3: Decentering “the west”

- Arnold, David. *Everyday Technology: Machines and the Making of India’s Modernity* (Chicago: University of Chicago Press, 2013).

Explores how small machines and consumer goods originating in Europe and North America became objects of everyday use in India in the late nineteenth and early twentieth centuries. “Rather than investigate “big” technologies such as railways and irrigation projects, Arnold examines the assimilation and appropriation of bicycles, rice mills, sewing machines, and typewriters in India, and follows their impact on the ways in which people worked and traveled, the clothes they wore, and the kind of food they ate. But the effects of these machines were not limited to the daily rituals of Indian society, and Arnold demonstrates how such small-scale technologies became integral to new ways of thinking about class, race, and gender, as well as about the politics of colonial rule and Indian nationhood.” (publisher’s abstract).

- Bigelow, Allison Margaret. *Mining Language: Racial Thinking, Indigenous Knowledge, and Colonial Metallurgy in the Early Modern Iberian World*. Chapel Hill: University of North Carolina Press, 2020.

“Mineral wealth from the Americas underwrote and undergirded European colonization of the New World; American gold and silver enriched Spain, funded the slave trade, and spurred Spain’s northern European competitors to become Atlantic powers. Building upon works that have narrated this global history of American mining in economic and labor terms, *Mining Language* is the first book-length study of the technical and scientific vocabularies that miners developed in the sixteenth and seventeenth centuries as they engaged with metallic materials. This language-centric focus enables Allison Bigelow to document the crucial intellectual contributions Indigenous and African miners made to the very engine of European colonialism.” (publisher’s abstract).

- Bhimull, Chandra D. *Empire in the Air: Airline Travel and the African Diaspora*. New York: NYU Press, 2017.

“*Empire in the Air* is at once a history of aviation, and an examination of how air travel changed lives along the transatlantic corridor of the African diaspora. Focusing on Britain and its Caribbean colonies, Chandra Bhimull reveals how the black West Indies shaped the development of British Airways. Bhimull offers a unique analysis of early airline travel, illuminating the links among empire, aviation, and diaspora, and in doing so provides insights into how racially oppressed people experienced air travel. The emergence of artificial flight revolutionized the movement of people and power, and Bhimull makes the connection between airplanes and the other vessels that have helped make and maintain the African diaspora: the slave ships of the Middle Passage, the tracks of the Underground Railroad, and Marcus Garvey's black-owned ocean liner. As a new technology, airline travel retained the racist ideas and practices that were embedded in British imperialism, and these ideas shaped every aspect of how commercial aviation developed, from how airline routes were set, to who could travel easily and who could not. The author concludes with a look at

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airline travel today, suggesting that racism is still enmeshed in the banalities of contemporary flight.” (publisher’s abstract)

- Bray, Francesca. *Technology and Gender Fabrics of Power in Late Imperial China*. Berkeley: University of California Press, 1997.

“In this feminist history of eight centuries of private life in China, Francesca Bray inserts women into the history of technology and adds technology to the history of women. Bray takes issue with the Orientalist image that traditional Chinese women were imprisoned in the inner quarters, deprived of freedom and dignity, and so physically and morally deformed by foot binding and the tyrannies of patriarchy that they were incapable of productive work. She proposes a concept of *gynotechnics*, a set of everyday technologies that define women's roles, as a creative new way to explore how societies translate moral and social principles into a web of material forms and bodily practices. Bray examines three different aspects of domestic life in China, tracing their developments from 1000 to 1800 A.D. She begins with the shell of domesticity, the house, focusing on how domestic space embodied hierarchies of gender. She follows the shift in the textile industry from domestic production to commercial production. Despite increasing emphasis on women's reproductive roles, she argues, this cannot be reduced to childbearing. Female hierarchies within the family reinforced the power of wives, whose responsibilities included ritual activities and financial management as well as the education of children.” (publisher’s abstract.)

- Bray, Francesca. *Technology, Gender and History in Imperial China : Great Transformations Reconsidered*. New York: Routledge, 2013.

In this book, Francesca Bray explores subjects such as technology and ethics, technology, and gendered subjectivities (both female and male), and technology and statecraft to illuminate how material settings and practices shaped topographies of everyday experience and ideologies of government, techniques of the self and technologies of the subject. Examining technologies ranging from ploughing and weaving to drawing pictures, building a house, prescribing medicine or composing a text, this book offers a rich insight into the interplay between the micro- and macro-politics of everyday life and the workings of governmentality in late imperial China, showing that gender principles were woven into the very fabric of empire, from cosmology and ideologies of rule to the material foundations of the state and the everyday practices of the domestic sphere. (publisher’s abstract)

- Bray, Francesca. *Moving Crops and the Scales of History*. New Haven, Connecticut: Yale University Press, 2023. Co-edited and written by Francesca Bray , Barbara Hahn , John Bosco Lourdusamy and Tiago Saraiva

A bold redefinition of historical inquiry based on the “cropscape”—the people, creatures, technologies, ideas, and places that surround a crop. Human efforts to move crops from one place to another have been a key driving force in history. Crops have been on the move for millennia, from wildlands into fields, from wetlands to dry zones, from one imperial colony to another. This book is a bold but approachable attempt to redefine historical inquiry based on the “cropscape”: the assemblage of people, places,

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creatures, technologies, and other elements that form around a crop. The cropscape is a method of reconnecting the global with the local, the *longue durée* with microhistory, and people, plants, and places with abstract concepts such as tastes, ideas, skills, politics, and economic forces. Through investigating a range of contrasting cropscales spanning millennia and the globe, the authors break open traditional historical structures of period, geography, and direction to glean insight into previously invisible actors and forces. (publisher's abstract)

- Breckenridge, Keith. "The Biometric State: The Promise and Peril of Digital Governance in the New South Africa," *Journal of Southern African Studies* 31(2): 267-282.

"In the political aftershocks of September 11, powerful interests in the United States and Britain have proposed the development of national systems of biometric identification and registration. For much of the last century, South Africans have lived with such a biometric order, and in recent years the democratic state has begun to invest in a massive scheme of digital biometrics for the delivery of benefits and the elimination of fraud. This HANIS system has been preceded by a massive project of digital biometric grant delivery that affects millions of people throughout the country. These systems are changing the nature of the state, and the relationship between private individuals and the commercial domain. For the countries considering a move from the decentralised order of paper-based identification to the new world of digital biometrics, there is much to be learned from a close study of contemporary South Africa." (publisher's abstract)

- Burton, Elise K. *Genetic Crossroads : the Middle East and the Science of Human Heredity*. Stanford, California: Stanford University Press, 2021.

"This book is the first history of the science of human genetics in the Middle East, from its roots in colonial anthropology and medicine to present-day genomic projects. Genetic Nationalism reveals the effects of international genetic discourses on Middle Eastern nationalisms and the significance of Middle Eastern genetics to the international scientific community. This book illuminates how genetic research simultaneously promotes national interests in the global community and enforces colonialism at home. Elise Burton reveals the political, social, and technological processes that have shaped genetic research in the twentieth century, tracing the global incorporation of nationalist historical narratives and identities into the broader understanding of human evolution." (publisher's abstract)

- Carney, Judith. *Black Rice: The African Origins of Rice Cultivation*. Cambridge: Harvard University Press, 2009.

"Few Americans identify slavery with the cultivation of rice, yet rice was a major plantation crop during the first three centuries of settlement in the Americas. Rice accompanied African slaves across the Middle Passage throughout the New World to Brazil, the Caribbean, and the southern United States. By the middle of the eighteenth century, rice plantations in South Carolina and the black slaves who worked them had created one of the most profitable economies in the world.

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Black Rice tells the story of the true provenance of rice in the Americas. It establishes, through agricultural and historical evidence, the vital significance of rice in West African society for a millennium before Europeans arrived and the slave trade began. The standard belief that Europeans introduced rice to West Africa and then brought the knowledge of its cultivation to the Americas is a fundamental fallacy, one which succeeds in effacing the origins of the crop and the role of Africans and African American slaves in transferring the seed, the cultivation skills, and the cultural practices necessary for establishing it in the New World. In this vivid interpretation of rice and slaves in the Atlantic world, Judith Carney reveals how racism has shaped our historical memory and neglected this critical African contribution to the making of the Americas.” (publisher’s abstract)

- Chikowero, Moses. “Subalternating Currents: Electrification and Power Politics in Bulawayo, Colonial Zimbabwe, 1894-1939,” *Journal of Southern African Studies* 2007 vol. 33 (2): 287-306.

This article demonstrates that public electricity supplies became available in Bulawayo, colonial Zimbabwe's second largest city, as early as 1897 and subsequently developed to become the major source of power and lighting for industries and homes by the 1930s. The article has two major thrusts; first, it traces how the Bulawayo Town Council nurtured home electrical mechanisation by subsidising both electricity consumption and the purchase of electrical home appliances. Second, it demonstrates that this electrical modernisation was a parochial project that benefited white settler residents of the town almost to the total exclusion of Africans. It concludes that, while electricity was a luxury enjoyed by those who were privileged to use it, the town council also harnessed it to control and police the underprivileged in a way that accentuated racial segregation in the town. (article abstract)

- D’Avignon, Robyn. “Spirited Geobodies: Producing Subterranean Property in Nineteenth-Century Bambuk, West Africa.” *Technology and Culture* 61, no. 2 Supplement (2020).

“How did African societies prior to colonialism give political form to geology? In nineteenth century Bambuk—an ancient gold-producing province that straddles the border of modern Senegal and Mali—Maninka gold miners produced claims to tracts of mineralized land by cultivating relationships with the spirit owners of underlying geological formations. Claims to these “spirited geobodies” were materialized at shrines, erected at the base of trees and on boulders, that signaled a sacrificial exchange relationship between Maninka lineages and spirits. Combining insights from the history and archeology of West Africa with the “global” turn in science and technology studies, this article engages with the occult as a concrete historical reality that made claims on people, land, and minerals. Such an approach is not merely an epistemological intervention into the historiography of technology. Rather, it is necessary for understanding how subterranean property was produced and defended in Africa's deeper past.” (article abstract)

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- Elshakry, Marwa. "When Science Became Western: Historiographical Reflections." *Isis* 101, no. 1 (2010): 98–109.

While thinking about the notion of the "global" in the history of the history of science, this essay examines a related but equally basic concept: the idea of "Western science." Tracing its rise in the nineteenth century, it shows how it developed as much outside the Western world as within it. Ironically, while the idea itself was crucial for the disciplinary formation of the history of science, the global history behind this story has not been much attended to. Drawing on examples from nineteenth-century Egypt and China, the essay begins by looking at how international vectors of knowledge production (viz., missionaries and technocrats) created new global histories of science through the construction of novel genealogies and through a process of conceptual syncretism. Turning next to the work of early professional historians of science, it shows how Arabic and Chinese knowledge traditions were similarly reinterpreted in light of the modern sciences, now viewed as part of a diachronic and universalist teleology ending in "Western science." It concludes by arguing that examining the global emergence of the idea of Western science in this way highlights key questions pertaining to the relation of the history of science to knowledge traditions across the world and the continuing search for global histories of science. (article abstract) Note: although this is a historiographical essay about the emergence of science as category, Elshakry draws on interesting examples from global technologies including ballistics, engineering and medicine.

- Freed, Libbie. "Networks of (colonial) power: roads in French Central Africa after World War I," *History and Technology* 26, no. 3 (2010): 203–223.

"Roads emerged as an ideal colonial technology in French Equatorial Africa and French Cameroon in the 1920s, not only because they allowed the French to shape landscapes and move around their territory, but also because their inherent technological flexibility enabled administrators to adapt European notions about roads to colonial goals, budgets, and geographies. Desiring motor vehicle-ready roads to link administrative and productive centers, but with little funding or engineering expertise from the metropole, colonial administrators in central Africa deliberately moved away from the quickly evolving cutting edge of road technologies. Instead, over the course of the 1920s they supervised the construction of over 12,000 kilometers of technically simple earthen roads built using hand tools and, especially, forced African labor. Because of the ways they reshaped the region's landscapes and relied on coerced labor from local populations, roads and road work became sites of contestation over colonial rule and order." (article abstract)

- Gómez, Pablo F. *The Experiential Caribbean: Creating Knowledge and Healing in the Early Modern Atlantic*. Chapel Hill: The University of North Carolina Press, 2017.

"Pablo F. Gómez examines the strategies that Caribbean people used to create authoritative, experientially based knowledge about the human body, healing, and the natural world during the long seventeenth century. Gómez treats the early modern intellectual culture of these mostly black and free Caribbean communities on its own

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merits and not only as justified by how it relates to well-known frameworks for the study of science and medicine.” (publisher’s abstract)

- Goucher, Candice L. “Iron Sails the Seas: A Maritime History of African Diaspora Iron Technology.” *Canadian Journal of Latin American and Caribbean Studies / Revue canadienne des études latino-américaines et caraïbes* 38, no. 2 (2013): 179–96.

This paper explores the maritime history of ironworking in the African diaspora. Although iron metallurgy is usually thought of as a landlocked activity, blacksmiths were onboard most transatlantic voyages. Ships and dockyards became critical sites of this mobility and the resultant technology transfer. Apart from the necessary tools on voyages, every ship had a blacksmith, the highest paid among its specialist craftsmen. By the eighteenth century, iron-clad ships carried cargoes of iron and slag, as well as the enslaved ironworkers, across the Atlantic. Evidence for the African-derived technologies and the smiths who traveled the seas are found in the artifacts, archival records, and performance arts of the Atlantic world. Archaeological evidence presented from three different types of eighteenth-century British Caribbean sites confirms that the working of iron was critical to activities on land and sea and produced a high demand for specialized craftsmen, including African metallurgists. (article abstract)

- Grace, Joshua. *African Motors : Technology, Gender, and the History of Development*. Durham ;: Duke University Press, 2021.

“In *African Motors*, Joshua Grace examines how Tanzanian drivers, mechanics, and passengers reconstituted the automobile into a uniquely African form between the late 1800s and the early 2000s. Drawing on hundreds of oral histories, extensive archival research, and his ethnographic fieldwork as an apprentice in Dar es Salaam’s network of garages, Grace counters the pervasive narratives that Africa is incompatible with technology and that the African use of cars is merely an appropriation of technology created elsewhere. Although automobiles were invented in Europe and introduced as part of colonial rule, Grace shows how Tanzanians transformed them, increasingly associating their own car use with *maendeleo*, the Kiswahili word for progress or development. Focusing on the formation of masculinities based in automotive cultures, Grace also outlines the process through which African men remade themselves and their communities by adapting technological objects and systems for local purposes.” (publisher’s abstract)

- Harding, Sandra. *The Postcolonial Science and Technology Studies Reader* (Durham, Duke University Press, 2011)

Sandra Harding’s collection of essays draws on postcolonial, feminist and science and technology studies. “In classic and recent essays, international scholars from a range of disciplines think through a broad array of science and technology philosophies and practices. The contributors reevaluate conventional accounts of the West’s scientific and technological projects in the past and present, rethink the strengths and limitations of non-Western societies’ knowledge traditions, and assess the legacies of colonialism and imperialism. Feminist science and technology concerns run throughout the reader and



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are the focus of several essays. Harding provides helpful background for each essay in her introductions to the reader's four sections." (publisher's abstract)

- Hart, Jennifer Anne. *Ghana on the Go: African Mobility in the Age of Motor Transportation*. Bloomington: Indiana University Press, 2016.

"As early as the 1910s, African drivers in colonial Ghana understood the possibilities that using imported motor transport could further the social and economic agendas of a diverse array of local agents, including chiefs, farmers, traders, fishermen, and urban workers. Jennifer Hart's powerful narrative of auto-mobility shows how drivers built on old trade routes to increase the speed and scale of motorized travel. Hart reveals that new forms of labor migration, economic enterprise, cultural production, and social practice were defined by autonomy and mobility and thus shaped the practices and values that formed the foundations of Ghanaian society today. Focusing on the everyday lives of individuals who participated in this century of social, cultural, and technological change, Hart comes to a more sensitive understanding of the ways in which these individuals made new technology meaningful to their local communities and associated it with their future aspirations." (publisher's abstract)

- Hart, Jennifer. "Of Pirate Drivers and Honking Horns: Mobility, Authority, and Urban Planning in Late-Colonial Accra." *Technology and Culture* 61, no. 2 (2020): S49-S76.

This article attempts to bridge two literatures—the African history of urban life and the colonial history of urban planning—to better understand the politics of African mobility. In doing so, it situates colonial histories of urban planning and emerging African cultures of auto-mobility within a broader critique of colonial technology and infrastructure. This article argues that the realities of indirect rule—the autonomy of African urban residents and the weakness of colonial authority and infrastructure—raised new questions and problems for colonial officials who were tasked with turning ideology into policy and practice. In particular, mobility politics allow us to trace the way that "average" people negotiated colonial politics within and outside of the formal, elite structures of elected Town Councils, Legislative Assemblies, or chieftaincy politics. Within the colonial bureaucracy and the Town Council, African elites negotiated their own prestige and status alongside the interests and demands of the city's lower- and middle-class populations. (article abstract)

- Hecht, Gabrielle. *Being Nuclear: Africans and the Global Uranium Trade*. Cambridge, Mass: MIT Press, 2012.

Hecht's vision of the nuclear world stands in sharp opposition to nuclear studies as conventionally understood. By exposing the disciplining effects of what she calls "nuclearity," this book unsettles well-worn cultures of nuclear behavior and scholarship. Nuclearity is an unstable and contested category that sanctions (in both senses) some "nation(s), program(s), technolog(ies), material(s), and workplace(s)" as properly nuclear while preventing others from being included in the same field. Nuclearity is not an attribute uniquely aligned with a fixed set of nuclear things as much as "a property *distributed among* things" that changes with time and place (p. 14; emphasis in

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original) The greatest absence from the nuclear world, Hecht argues, is Africa. Long the source of most of the world's uranium, a key ingredient of nuclear power, Africa's uranium suppliers have only rarely been seen as part of the nuclear world, with the notable exception of South Africa. The book is divided into two parts: the first locates nuclear power within a global political economy—"Proliferating Markets"—while the second takes on the task of exploring "Nuclear Work," a historical and ethnographic account of mines, labor, exclusion, and sickness in the uranium zones of Madagascar, Gabon, South Africa, and Namibia. Together, they work to give entirely new meanings to nuclear power, introducing new actors, archives, networks, spaces, and techniques, while also removing the nuclear object from its familiar location within state-centered regimes of secrecy and control. (Reviewed by Itty Abraham in *Technology and Culture*, 2013)

- Hecht, Gabrielle. "Hopes for the Radiated Body: Uranium Miners and Transnational Technopolitics in Namibia," *Journal of African History* 51:2 (June 2010): 213-234.

This article explores the transnational politics of technology and science at the Rossing uranium mine in Namibia. During the 1980s, Rossing workers refashioned surveillance technologies into methods for trade union action. When national independence in 1990 failed to produce radical ruptures in the workplace, union leaders engaged in technopolitical strategies of extraversion, and became knowledge producers about their own exposure to workplace contaminants. Appeals to outside scientific authority carried the political promise of international accountability. But engaging in science meant accepting its boundaries, and workers ultimately discovered that technopolitical power could be limiting as well as liberating. (article abstract)

- Kriger, Colleen. *Pride of Men: Ironworking in 19th century West Central Africa* (Heinemann, 1999).

"Admired, respected, and remembered as legendary heroes, ironworkers occupied a special social position in precolonial west central Africa. *Pride of Men* investigates how and why this was so. Colleen Kriger unveils the "mystique" of ritual and legend surrounding ironworking to shed light on the labor processes, workplaces, and metal wares that were deemed so indispensable to central African societies. She identifies complex patterns of iron production and consumption that reveal master blacksmiths, as opposed to smelters, to be the key for understanding the special status of ironworkers during the nineteenth century. Successful smiths were wealthy and worldly. In addition to designing and making effective tools and weapons, metallic forms of currencies, and impressive symbols of prestige, blacksmiths created and reshaped social networks and cultural values that extended far beyond their own local communities." (publisher's abstract).

- Kusiak, Pauline. "'Tubab' technologies and 'African' ways of knowing: nationalist techno-politics in Senegal," *History and Technology* 26:3: 225-249.

"This article explores the social experience of radiology in contemporary Senegal. I argue that the intertwining of culturalist discourses into technical practice make it

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possible for radiological technology to be seen as mysterious and powerful.” (article abstract)

- Lee, Jung. “Invention without Science: ‘Korean Edisons’ and the Changing Understanding of Technology in Colonial Korea.” *Technology and Culture* 54 (no. 4, 2013): 782–

“This article tells the story of self-made inventors in colonial Korea during the 1920s and the 1930s, and the impact of their inventive practice on colonial Koreans' understanding of the newly introduced concept of invention...The colonial authorities and Korean cultural elites portrayed invention as practiced by scientific professionals and thus grandly innovative and foreign. But self-made Korean inventors upended all these notions because these individuals were scarcely educated, knew little science, and worked on seemingly trivial devices or small improvements of tools associated with everyday life in Korea. Gradually, some indigenous elites began to shift their perspective to argue that invention was native, culturally embedded, incremental...For these elites, the grassroots activities of self-made inventors could and should define what invention and technology meant for colonial Koreans instead of imported things like the telegraph and steam engine.” (introduction and publisher’s abstract)

- Lim, S. “Photography and Forgery in Early Capitalist Siam.” *Technology and Culture* 60, no. 3 (2019): 795–815.

“This article examines the introduction of two technologies, photography, and paper currency, in Siam (Thailand after 1939) during the early twentieth century and their roles in shaping the development of the modern Thai political economy. It does so through a historical study of a counterfeit crisis that plagued the kingdom immediately after the introduction of paper money in 1902. By analyzing the crisis, it shows how the formation of class and development of capitalism both depended on technologically reproduced symbols of the state and social status. As such, policing the distinction between genuine and fake became critical to both the identity of the new bourgeoisie and the operation of the new economy. The resulting fixation on authenticity, in turn, reflects the underlying anxiety on the part of the new elite over the basis of their authority and wealth in a rapidly changing society.” (publisher’s abstract)

- López Beltrán, Carlos, Vivette García Deister, and Mariana Rios Sandoval. “Negotiating the Mexican Mestizo: On the Possibility of a National Genomics.” In *Mestizo Genomics*, 85–106. New York, USA: Duke University Press, 2020.

In genetics laboratories in Latin America, scientists have been mapping the genomes of local populations, seeking to locate the genetic basis of complex diseases and to trace population histories. As part of their work, geneticists often calculate the European, African, and Amerindian genetic ancestry of populations. Some researchers explicitly connect their findings to questions of national identity and racial and ethnic difference, bringing their research to bear on issues of politics and identity. Drawing on ethnographic research in Brazil, Colombia, and Mexico, the contributors to *Mestizo Genomics* explore how the concepts of race, ethnicity, nation, and gender enter into and are affected by genomic research. In Latin America, national identities are often based on ideas about *mestizaje* (race mixture), rather than racial division. Since

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mestizaje is said to involve relations between European men and indigenous or African women, gender is a key factor in Latin American genomics and in the analyses in this book. Also important are links between contemporary genomics and recent moves toward official multiculturalism in Brazil, Colombia, and Mexico. One of the first studies of its kind, *Mestizo Genomics* sheds new light on the interrelations between "race," identity, and genomics in Latin America. (publisher's abstract)

- Mavhunga, Clapperton Chakanetsa. *Transient Workspaces: Technologies of Everyday Innovation in Zimbabwe*. Cambridge, MA: The MIT Press, 2014.

"In this book, Clapperton Mavhunga views technology in Africa from an African perspective. Technology in his account is not something always brought in from outside, but is also something that ordinary people understand, make, and practice through their everyday innovations or creativities -- including things that few would even consider technological. Technology does not always originate in the laboratory in a Western style building but also in the society in the forest, in the crop field, and in other places where knowledge is made and turned into practical outcomes. African creativities are found in African mobilities. Mavhunga shows the movement of people as not merely conveyances across space but transient workspaces. Taking indigenous hunting in Zimbabwe as one example, he explores African philosophies of mobilities as spiritually guided and of the forest as a sacred space. Viewing the hunt as guided mobility, Mavhunga considers interesting questions of what constitutes technology under regimes of spirituality. He argues that these practices need to be decriminalized and examined as technologies of everyday innovation with a view toward constructive engagement, innovating with Africans rather than for them." (publisher's abstract)

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

This book examines how the presence of the tsetse fly turned the forests of Zimbabwe and southern Africa into an open laboratory where African knowledge formed the basis of colonial tsetse control policies. *The Mobile Workshop* traces the pestiferous work that an indefatigable, mobile insect does through its movements, and the work done by humans to control it. The book restores the central role not just of African labor but of African intellect in the production of knowledge about the tsetse fly. It describes how European colonizers built on and beyond this knowledge toward destructive and toxic methods, including cutting down entire forests, forced "prophylactic" resettlement, massive destruction of wild animals, and extensive spraying of organochlorine pesticides. Throughout, the book Mavhunga uses African terms to describe the African experience, taking vernacular concepts as starting points in writing a narrative of *ruzivo* (knowledge) rather than viewing Africa through foreign keywords. (publisher's abstract)

- Medina, Eden, Christina Holmes, and Ivan da Costa Marques, eds. *Beyond Imported Magic: Essays on Science, Technology, and Society in Latin America* (Cambridge, MA: MIT Press, 2014)

"The essays in this volume study the creation, adaptation, and use of science and technology in Latin America. They challenge the view that scientific ideas and

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technology travel unchanged from the global North to the global South—the view of technology as “imported magic.” They describe not only alternate pathways for innovation, invention, and discovery but also how ideas and technologies circulate in Latin American contexts and transnationally. The contributors' explorations of these issues, and their examination of specific Latin American experiences with science and technology, offer a broader, more nuanced understanding of how science, technology, politics, and power interact in the past and present. The essays in this book use methods from history and the social sciences to investigate forms of local creation and use of technologies; the circulation of ideas, people, and artifacts in local and global networks; and hybrid technologies and forms of knowledge production. They address such topics as the work of female forensic geneticists in Colombia; the pioneering Argentinean use of fingerprinting technology in the late nineteenth century; the design, use, and meaning of the XO Laptops created and distributed by the One Laptop per Child Program; and the development of nuclear energy in Argentina, Mexico, and Chile.” (publisher’s abstract).

- Medina, Eden. *Cybernetic Revolutionaries: Technology and Politics in Allende’s Chile*. Cambridge, MA: MIT Press, 2011.

In *Cybernetic Revolutionaries*, Eden Medina tells the history of two intersecting utopian visions, one political and one technological. The first was Chile's experiment with peaceful socialist change under Salvador Allende; the second was the simultaneous attempt to build a computer system that would manage Chile's economy. Neither vision was fully realized—Allende's government ended with a violent military coup; the system, known as Project Cybersyn, was never completely implemented—but they hold lessons for today about the relationship between technology and politics. Drawing on extensive archival material and interviews, Medina examines the cybernetic system envisioned by the Chilean government—which was to feature holistic system design, decentralized management, human-computer interaction, a national telex network, near real-time control of the growing industrial sector, and modeling the behavior of dynamic systems. She also describes, and documents with photographs, the network's Star Trek-like operations room, which featured swivel chairs with armrest control panels, a wall of screens displaying data, and flashing red lights to indicate economic emergencies. (publisher's abstract)

- Mika, Marissa. "The Half-Life of Radiotherapy and Other Transferred Technologies." *Technology and Culture* 61, no. 2 (2020): S135-S157.

This article considers the long-term ramifications of biomedical technology transfer in Uganda. It tells the story of the procurement of a radiotherapy machine through a partnership with the International Atomic Energy Agency (IAEA) in the early 1990s. This radiotherapy machine was seen as “rugged,” “simple,” “affordable,” and capable of quickly and cost-effectively treating cancer patients. By the late 2000s, this machine had a reputation for frequent disruptions of service due to breakdowns large and small. In addition, the Cobalt-60 source was severely depleted and in need of replacement. The article highlights the constellation of efforts and decisions made by Ugandan physician-scientists, mechanics, and technocrats to keep radiotherapy services going.

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The article suggests that the history of the radiotherapy machine offers a much-needed perspective on the half-life of technology transfer, the darker side of repair, and the politics of responsibility. (article abstract)

- Mizuno, Hiromi, Aaron S. Moore, John DiMoia, eds., *Engineering Asia: Technology, Colonial Development, and the Cold War Order* (Bloomsbury Publishing, 2018)

“Weaving together chapters on imperial Japan's wartime mobilization, Asia's first wave of postwar decolonization, and Cold War geopolitical conflict in the region, *Engineering Asia* seeks to demonstrate how Asia's present prosperity did not arise from a so-called 'economic miracle' but from the violent and dynamic events of the 20th century. The book argues that what continued to operate throughout these tumultuous eras were engineering networks of technology. Constructed at first for colonial development under Japan, these networks transformed into channels of overseas development aid that constituted the Cold War system in Asia.” (publisher's abstract)

- Mukharji, Projit Bihari. *Doctoring Traditions: Ayurveda, Small Technologies, and Braided Sciences*. Chicago: The University of Chicago Press, 2016.

Like many of the traditional medicines of South Asia, Ayurvedic practice changed dramatically in the later nineteenth and early twentieth centuries. With "Doctoring Tradition", Projit Bihari Mukharji offers a close look at that transformation, upending the widely held yet little-examined belief that it was the result of the introduction of Western anatomical knowledge and cadaveric dissection. Rather, Mukharji reveals, what instigated those changes were a number of small technologies that were introduced in the period by Ayurvedic physicians, men who were simultaneously Victorian gentlemen and members of a particular Bengali caste. The introduction of these devices, including thermometers, watches, and microscopes, Mukharji shows, ultimately led to a dramatic reimagining of the body. The new Ayurvedic body that thus emerged by the 1930s, while different from the biomedical body, was nonetheless largely compatible with it. The more incompatible elements of the old Ayurvedic body were then rendered therapeutically indefensible and impossible to imagine in practice. The new Ayurvedic medicine, therefore, was the product not of an embrace of Western approaches, but of a creative attempt to develop a viable alternative to the Western tradition by braiding together elements drawn from both the West and the East. (publisher's abstract)

- Mullaney, Thomas S. *The Chinese Typewriter: A History*. Cambridge, MA: MIT Press, 2017.

“Chinese writing is character based, the one major world script that is neither alphabetic nor syllabic. Through the years, the Chinese written language encountered presumed alphabetic universalism in the form of Morse Code, Braille, stenography, Linotype, punch cards, word processing, and other systems developed with the Latin alphabet in mind. This book is about those encounters—in particular thousands of Chinese characters versus the typewriter and its QWERTY keyboard. Thomas Mullaney describes a fascinating series of experiments, prototypes, failures, and successes in the century-long quest for a workable Chinese typewriter.” (publisher's abstract).



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- Osborn, Emily. "Casting aluminum cooking pots: labour, migration, and artisan production in West Africa's informal sector, 1945-2005," *African Identities*, Vol. 7, no. 3 (August 2009): 373-386.

"This article investigates the history of aluminium casting, a sector of the informal economy devoted to recycling scrap aluminium. Artisans who cast aluminium make a variety of products out of scrap, including various utensils and receptacles for food preparation, such as cooking pots. While labour and its history in West Africa has garnered much historical research, as has the work of artisans who specialise in working other types of metal, especially iron, little attention has been paid to aluminium casting. The oversight is significant, because the diffusion of aluminium casting opens up a history on the transnational movement of labour and artisan production in late colonial and post-colonial Africa." (article abstract)

- Raj, Kapil. "Go-Betweens, Travelers, and Cultural Translators." In *A Companion to the History of Science*, 39-57. Hoboken, NJ, USA: John Wiley & Sons, Inc, 2016.

Thanks to the rising interest amongst historians in the interconnections between cultures, the crucial role of go-betweens in their construction has become an important subject of study over the last decades. This chapter traces the variety of approaches on the subject adopted by cultural and social historians and anthropologists as well as the theoretical reflections by classical sociologists. It then tackles the subject of go-betweens in the world of knowledge and science through the way they have been problematized in recent work in the history of science and the resulting change in the narrative from one of an agonistic "clash of cultures" to that of actively constructed connections. After presenting a concrete historical example from the late seventeenth century to show the decisive role of intermediation in the construction of knowledge in intercultural contexts, it concludes with an argument for the relevance and importance of studying go-betweens in the contemporary world for the construction of intercultural and interdisciplinary knowledge. (publication abstract)

- Rood, Daniel. *The Reinvention of Atlantic Slavery: Technology, Labor, Race, and Capitalism in the Greater Caribbean*. New York, NY: Oxford University Press, 2017.

"The period of the "second slavery" was marked by geographic expansion of zones of slavery into the Upper US South, Cuba and Brazil and chronological expansion into the industrial age. As *The Reinvention of Atlantic Slavery* shows, ambitious planters throughout the Greater Caribbean hired a transnational group of chemists, engineers, and other "plantation experts" to assist them in adapting industrial technologies to suit their "tropical" needs and increase profitability. Not only were technologies reinvented to keep manufacturing processes local, but slaveholders' adaptation of new racial ideologies also shaped their particular usage of new machines. These businessmen forged a new set of relationships with one another to sidestep the financial dominance of Great Britain and the northeastern United States." (publisher's abstract).

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- Sarkar, Smritikumar. *Technology and Rural Change in Eastern India 1830–1980*. New Delhi: Oxford University Press, 2014.

This book, a social history of technology, analyses the context and results of technology induction to the villages, such as the railways redrawing the morphology of rural settlement, the new tools leading to empowerment of artisans or their dispossession due to mechanization. With an aim to trace the interrelationship between technology and village society, the author has looked beyond official archives and used rare local-level sources. Blending socio-economic data with folk usage, oral traditions, songs, and sayings, the book integrates the local, national, and global into a historical analysis of the spread of technology in the colonial context.” (publisher’s abstract).

- von Schnitzler, Antina. *Democracy’s Infrastructure: Techno-Politics and Protest After Apartheid* Princeton: Princeton University Press, 2016.

“In the past decade, South Africa’s “miracle transition” has been interrupted by waves of protests in relation to basic services such as water and electricity. Less visibly, the post-apartheid period has witnessed widespread illicit acts involving infrastructure, including the nonpayment of service charges, the bypassing of metering devices, and illegal connections to services. *Democracy’s Infrastructure* shows how such administrative links to the state became a central political terrain during the antiapartheid struggle and how this terrain persists in the post-apartheid present. Focusing on conflicts surrounding prepaid water meters, Antina von Schnitzler examines the techno-political forms through which democracy takes shape.” (publisher’s abstract).

- Seow, Victor. *Carbon Technocracy: Energy Regimes in Modern East Asia*. Chicago: University of Chicago Press, 2022.

“In *Carbon Technocracy*, Victor Seow uses the remarkable story of the Fushun colliery to chart how the fossil fuel economy emerged in tandem with the rise of the modern technocratic state. Taking coal as an essential feedstock of national wealth and power, Chinese and Japanese bureaucrats, engineers, and industrialists deployed new technologies like open-pit mining and hydraulic stowage in pursuit of intensive energy extraction. But as much as these mine operators idealized the might of fossil fuel-driven machines, their extractive efforts nevertheless relied heavily on the human labor that those devices were expected to displace. Under the carbon energy regime, countless workers here and elsewhere would be subjected to invasive techniques of labor control, ever-escalating output targets, and the dangers of an increasingly exploited earth.” (publisher’s abstract).

- Seow, Victor. “A tradition of invention: The paradox of glorifying past technological breakthroughs”, *East Asian Science, Technology and Society* (2022) 16:349–366

This article examines how the notion of a tradition of invention, which took shape in China in the nineteenth century, became entrenched there by the 1920s. While staking claim to a tradition of invention may have been ultimately for the purpose of charting a course toward a technoscientific tomorrow, the fixation on those past accomplishments led many Chinese across China’s long twentieth century to either ignore or downplay

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domestic developments in science and technology that were actually taking place. Ironically, then, the nagging sense of inferiority that underlay the lauding of ancient inventions came to be reinforced rather than alleviated by that very act. (article abstract)

- Serlin, David. "Confronting African Histories of Technology: A Conversation with Keith Breckenridge and Gabrielle Hecht," *Radical History Review* 127 (January 2017): 87-102.

"In this conversation, historians Breckenridge and Hecht discuss the status of African histories of technology since decolonization. Academic interest in African technology, as well as technologies and infrastructures with significant connections to Africa, began to decline in the mid-1980s and with some exceptions was long confined to anthropology and archaeology. Historians of technology are now returning to the study of African technological infrastructures and users. By paying attention to the specificity of industrial production, to material and political infrastructures, and to gaps and dependencies, Breckenridge and Hecht suggest possible directions for contemporary and future African histories of technology." (article abstract)

- Soto Laveaga, Gabriela. *Jungle Laboratories: Mexican Peasants, National Projects, and the Making of the Pill*. Durham, NC: Duke University Press, 2009.

"In *Jungle Laboratories*, Gabriela Soto Laveaga reconstructs the story of how rural yam pickers, international pharmaceutical companies, and the Mexican state collaborated and collided over the barbasco. By so doing, she sheds important light on a crucial period in Mexican history and challenges us to reconsider who can produce science. Soto Laveaga traces the political, economic, and scientific development of the global barbasco industry from its emergence in the 1940s, through its appropriation by a populist Mexican state in 1970, to its obsolescence in the mid-1990s. She focuses primarily on the rural southern region of Tuxtepec, Oaxaca, where the yam grew most freely and where scientists relied on local, indigenous knowledge to cultivate and harvest the plant. Rural Mexicans, at first unaware of the pharmaceutical and financial value of barbasco, later acquired and deployed scientific knowledge to negotiate with pharmaceutical companies, lobby the Mexican government, and ultimately transform how urban Mexicans perceived them. By illuminating how the yam made its way from the jungles of Mexico to domestic and foreign scientific laboratories where it was transformed into pills, to the medicine cabinets of millions of women across the globe, *Jungle Laboratories* urges us to recognize the ways that Mexican peasants attained social and political legitimacy in the twentieth century, and positions Latin America as a major producer of scientific knowledge." (publisher's abstract).

- Soto Laveaga, Gabriela. "Of Canals, Rivers and the Right to Exist: New (?) Methodological Tools for a Changed World." *Science, Technology & Society (New Delhi, India)* 28, no. 1 (2023): 77-82.

What can a dying river teach us about post/de-colonial science and technology? In a post-COVID world, absence and loss will be a constant presence in the lives of most.

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While thinking with erasures and absence in science and technology studies is not new, our current moment pushes us to burrow deeper into the histories of technologies that produce manufactured empty space, examine histories that pushed groups to the fringes of documented memory and encourage us to ponder how we must deal with these moments. This essay examines what the Yaqui River and the history of the Yaqui in Sonora can teach us about historical erasures and new meanings in landscapes and waterways lost to agro-business. (article abstract)

- Stoler, Ann Laura. *Imperial Debris: on Ruins and Ruination*. Durham: Duke University Press, 2013.

*Imperial Debris* redirects critical focus from ruins as evidence of the past to "ruination" as the processes through which imperial power occupies the present. Ann Laura Stoler's introduction is a manifesto, a compelling call for postcolonial studies to expand its analytical scope to address the toxic but less perceptible corrosions and violent accruals of colonial aftermaths, as well as their durable traces on the material environment and people's bodies and minds. In their provocative, tightly focused responses to Stoler, the contributors explore subjects as seemingly diverse as villages submerged during the building of a massive dam in southern India, Palestinian children taught to envision and document ancestral homes razed by the Israeli military, and survival on the toxic edges of oil refineries and amid the remains of apartheid in Durban, South Africa. They consider the significance of Cold War imagery of a United States decimated by nuclear blast, perceptions of a swath of Argentina's Gran Chaco as a barbarous void, and the enduring resonance, in contemporary sexual violence, of atrocities in King Leopold's Congo. Reflecting on the physical destruction of Sri Lanka, on Detroit as a colonial metropole in relation to sites of ruination in the Amazon, and on interactions near a UNESCO World Heritage Site in the Brazilian state of Bahia, the contributors attend to present-day harms in the occluded, unexpected sites and situations where earlier imperial formations persist. Ariella Azoulay, John F. Collins, Sharad Chari, E. Valentine Daniel, Gastón Gordillo, Greg Grandin, Nancy Rose Hunt, Joseph Masco, Vyjayanthi Venuturupalli Rao, Ann Laura Stoler. (publisher's abstract)

- Storey, William K. "Guns, Race, and Skill in Nineteenth-Century Southern Africa." *Technology and Culture* 4 (2004) 687–711.

South Africans of the early nineteenth century adapted guns and skills to local circumstances, and mimeomorphic firearm skills that would appear to be universal turn out to be subject local variation. The methodological challenge and ideological nature of descriptions of skill are explored treating some skill descriptions empirically, as a way of advancing the closely related argument about the verifiable decline of game and shooting skills. (article abstract)

- Sarkar, Suvobrata. *Let There Be Light: Engineering, Entrepreneurship and Electricity in Colonial Bengal, 1880-1945*. New Delhi: Cambridge University Press, 2020.

"Social and economic history of science and technology has emerged as a major theme of interdisciplinary research in South Asian history since the late 1990s. This book studies the correlation between technological knowledge and industrial performance, with the focus on electricity, an emerging technology during 1880 and 1945. The arrival

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of electricity necessitated the introduction of new institutional facilities, and with the growth of technological system, a new business culture grew - there was demand for trained manpower to handle machines and better educational facilities. Taking a broad view of the subject, the narrative of this book is built around the historical experiences of the local Bengali-speaking population. Adopting the social constructionist model, *Let There Be Light* presents an amalgamation of archival and Indian language source materials to delineate the diverse nature of the appropriation of technological ideas into Indian culture." (publisher's abstract).

- Thompson, Drew. "'*Não há Nada*' ('There is Nothing'): Absent Headshots and Identity Documents in Independent Mozambique." *Technology and Culture* 61, no. 2 (2020): S104-S134.

By 1983, Mozambique was seven years into independence from Portugal and at war on two fronts. Inside of Mozambique, populations confronted famine and long lines for government services. In response, the government launched *Operação Produção*, a program that relocated populations from overcrowded cities to the countryside in the northern province of Niassa. Two weeks into the program, state officials required people to present photo IDs. Not only did people not have the accepted forms of identification, many had never seen a headshot of themselves. Too often the literature on bureaucracy and technology undervalues the importance of photography. Similarly, photographic studies assume that photographs exist in printed form and that state governments all have the same capacities to archive and retrieve IDs. Breaking with these bodies of literature, as well as with Mozambique's nationalist historiography, I historicize the introduction of IDs in Mozambique after independence and explain how state and non-state actors addressed photography's absence. (article abstract)

- Tilley, Helen. "A Great (Scientific) Divergence: Synergies and Fault Lines in Global Histories of Science." *Isis* 110, no. 1 (2019): 129–36.

"Historians of science have a lingering Europe (and U.S.) problem, even as the field has undergone its own transnational, imperial, and global turns that have broadened its scope. Likewise, area studies scholars have a lingering science problem, in spite of the growing chorus of voices insisting that non-European peoples' knowledge and innovations warrant a place in global histories about science, technology, and medicine. This essay examines these two fault lines using the biochemist-turned-historian Joseph Needham as a point of departure. Needham's studies of science in China not only decentered Europe but also raised central questions about how science and its companions, reality and reason, would be defined. The essay takes a closer look at debates arising from these fault lines and urges scholars to experiment with polycentric histories of science that are coterminous and intersecting. It also underscores the need for new syntheses of research on the ways intellectuals, bricoleurs, and politics the world over have generated and transformed ideas and tools in motion." (article abstract)

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- Tilley, Helen. *Africa as a Living Laboratory: Empire, Development, and the Problem of Scientific Knowledge, 1870-1950*. Chicago: University of Chicago Press, 2011.

"Africa as a Living Laboratory argues that a few decades' worth of Africanist scholarship has misinterpreted colonial scientists and their work on topics as diverse as agriculture, the environment, medicine, racial science, and anthropology. Tilley claims the book "points to the colonial origins of a range of critiques that scholars in African studies have long suggested are products of postcolonial thinking" (p. 329). Drawing on the personal writings and scientific reports of the scientists, Tilley argues that these colonial employees embraced African knowledge (which she calls "vernacular science") and integrated African practices into their own work. These scientists also grappled with the concepts of complexity and interdependence and emphasized the importance of localizing knowledge. These surprising sensitivities led them to produce new knowledge calling into question the tenets of colonialism, leading to "epistemic decolonization" and ultimately "destabilizing] the foundations of imperial rule" (pp. 322, 320)." (Reviewed by Melissa Graboyes, *Journal of African Historical Studies*, 2011))

- Twagira, Laura Ann "Introduction: Africanizing the History of Technology," *Technology and Culture* 61, no. 2S (2020): S1–S19.

Essays in this special issue seek to "Africanize knowledge". They share an understanding of the history of African technologies as being highly mobile and characterized by adaptation and transformation. In this context Twagira argues, "the history of technology is central for scholars seeking to write about the African past. The scholars contributing to this issue would also argue that African history is critical for the writing of wider technological stories about the past." Essays examine African technological epistemologies and historical stories across multiple time periods and in diverse regions. Robyn d'Avignon focuses on the ritual and productive work of West African miners in "Spirited Geobodies: Producing Subterranean Property in Nineteenth Century Bambuk" (Senegal/Mali). Jennifer Hart examines colonial culture in West Africa through emerging practices of mobility and popular urban planning in "Of Pirate Drivers and Honking Horns: Mobility, Authority, and Urban Planning in Late-Colonial Accra" (Ghana). Laura Ann Twagira draws attention to women's work and the gendering of technological infrastructures across the precolonial, colonial, and postcolonial eras in West Africa in "Machines that Cook or Women Who Cook? Lessons from Mali on Technology, Labor, and Women's Things." Drew Thompson reexamines the twentieth-century history of photography for southern Africa by analyzing the material consequences of a system of bureaucratic surveillance based on absences (the absence of material and the absence of photographs) in "'*Não há Nada*' ('There is Nothing'): Absent Headshots and Identity Documents in Independent Mozambique." Marissa Mika centers her examination of postcolonial medical infrastructures and therapeutic practices on the multiple problems of technology transfer and repair in Uganda in "The Half-Life of Radiotherapy and Other Transferred Technologies." Finally, Mahriana Rofheart examines multiple techno-cultural imaginaries and their historical entanglements in "Fictional Technologies of Collaboration." Taken together, these essays suggest new ways to Africanize the history of technology and to write histories



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that place technology at the center of our understanding of Africa.” (from the editor’s introduction)

- Twagira, Laura Ann. "Machines That Cook or Women Who Cook? Lessons from Mali on Technology, Labor, and Women’s Things." *Technology and Culture* 61, no. 2 (2020): S77-S103

By the last quarter of the twentieth century, grain mills had proliferated across rural Mali and were central to the story of women and development. Yet, proponents of such supposed labor-saving technologies often assumed that women in Africa have little technological experience or knowhow. The present article examines this well-worn narrative with an emphasis on the ways in which Malian women have interrogated different technological interventions from their own shifting perceptions. It is a history that predates the introduction of grain mills and post-colonial development and focuses on women’s savvy when it came to assessing new technologies, especially in relation to cooking. This historical examination further illuminates not only women’s concern for labor-saving technologies, but also women’s ability to shape the infrastructure of their work. In so doing, they gender their tools as women’s things and assert control over the meanings of their own work and status. (article abstract)

- Wang, Jessica. "Agricultural Expertise, Race, and Economic Development: Small Producer Ideology and Settler Colonialism in the Territory of Hawai’i, 1900-1917." *History and Technology* 36, nos. 3-4 (2020): 301-36.

“This essay explores the technical practices of economic development in early twentieth century Hawai’i, where agrarianism, race, and competing colonialisms shaped agricultural experts’ perceptions of the islands’ future. Technical activities in the form of horticultural experiments aimed at introducing new crops, research on soil and fertilizers, work on plant diseases and insect pests, shipping experiments and marketing efforts, analytical testing services, and outreach to farming communities constituted the key means by which the United States Department of Agriculture’s Hawaii Agricultural Experiment Station pushed for fundamental economic and social transformations in the Territory of Hawaii. A populist anti-imperialist ideology drove the experiment station’s agenda, in an explicitly stated project of Americanization that sought to break Hawaiian dependence on sugar and plantation agriculture, expand small farming, and remake the islands’ racial order through white settlement from the mainland. Ultimately, the USDA’s brand of settler colonialism failed to supplant the existing plantation economy.” (article abstract).

- Wickramasinghe, Nira. *Metallic Modern: Everyday Machines in Colonial Sri Lanka* (New York, NY: Berghahn Books, 2014).

“Everyday life in the Crown colony of Ceylon (Sri Lanka) was characterized by a direct encounter of people with modernity through the consumption and use of foreign machines – in particular, the Singer sewing machine, but also the gramophone, tramway, bicycle, and varieties of industrial equipment. The ‘metallic modern’ of the 19th and early 20th century Ceylon encompassed multiple worlds of belonging and imagination; and enabled diverse conceptions of time to coexist through encounters with Siam, the United States and Japan as well as a new conception of urban space in

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Colombo. *Metallic Modern* describes the modern as it was lived and experienced by non-elite groups – tailors, seamstresses, shopkeepers, workers – and suggests that their idea of the modern was nurtured by a changing material world.” (publisher’s abstract)