

## HISTORY 790S-12

Environmental Sciences and Ecological Histories  
(Topics in History of Science and Technology)  
Fall 2021

Evan Hepler-Smith (evan.heplersmith@duke.edu)

Tuesdays 3:30pm – 6:00pm, Classroom Building 229

Office Hours: T 11:45am-1:30pm, picnic benches behind Social Sciences (West) or rain location TBD; W 1:30-3:30pm (Zoom – see Sakai for link)

In this seminar, "**Environmental Sciences and Ecological Histories**," we'll be reading scholarship of two sorts: 1) histories that **use** ecological concepts and environmental science evidence to structure historical analysis ("ecological histories"), and 2) histories **of** ecology and environmental sciences.

Our working hypothesis in bringing together these two sorts of scholarship is that:

- By examining the historical development of ways of knowing the environment (inside and outside western natural science disciplines), histories of environmental science can help us do and critique ecological history in more informed and responsible fashion, just as scholarship in archival studies does for archives-based research.
- By illuminating stories made legible through scientific modes of analysis and shaped by developments in science and technology, ecological histories can help identify the broader significance of histories of environmental science, including stories that remain to be told.

**Grading:** Participation 50% ▪ Term proj. 30% ▪ Presentation(s) 10% ▪ Book review 10%

**Attendance:** Attendance is vital... but things come up, especially this term. Everyone gets one absence as a "personal day," no questions asked. If you have to miss more than one meeting, please be in touch with me. We'll figure out a suitable way for you to participate from afar and/or a make-up exercise, if applicable.

**Participation and Presentations:** Active participation in seminar discussions is required. Each week, one student (or the instructor) will present a brief (<10 minute) contextual overview of the primary reading for the week, addressing **a)** historical subject matter and **b)** historiographic, conceptual, and/or theoretical contributions, posing discussion questions of both sorts.

*Syllabus subject to change at instructors' discretion.*

**Term Project:** Term projects due via email by end of day Monday, Dec 13.

Term project options include:

- a) a historiographic review of approximately 20 pages (5,000 words) presenting an argument about trends in scholarly analysis, promising questions/methods for future scholarship, interdisciplinary intersections and divergences, methodological disputes, and/or other aspects of scholarship on a topic related to the subject matter of our course;
- b) a polished draft of an original research paper of approximately the length and scope of an academic journal article, addressing a topic related to the subject matter of our course;
- c) an annotated syllabus for an original, semester-long course addressing a topic related to the subject matter of our course.
- d) an original dissertation proposal outlining a full-length research project addressing a topic and/or engaging methods related to the subject matter of our course. This must contain a discussion of existing literature, archives and sources to be consulted, the significance of your study, and the benefits of your proposed approach. (There is no expectation that you will actually select this as your dissertation topic!)
- e) work of similar scope and intellectual rigor that will advance your scholarly interests.

**Unforeseen conflicts:** We're committed to being flexible and making accommodations that are fair to all. If you anticipate trouble, please speak with us as soon as possible. The more we can stay ahead of challenging circumstances, the better we'll be able to navigate them.

**Accommodations and accessibility:** We want to do all we can to ensure that this class is accessible, inclusive, and equitable for all students. Please notify us within the first two weeks of class (or as soon as possible thereafter, for concerns arising mid-semester) with information about accommodations that we can provide to ensure accessibility, per the [Student Rights and Responsibilities](#) of the Duke accessibility office. If you have other concerns about classroom inclusiveness, please let us know. We will work with you!

**Late submissions:** Except with prior consultation and written consent of instructor, a *\*1/3 letter grade\** (A to A-, A- to B+, etc.) will be deducted from assignments submitted after the deadline listed on the syllabus. An *\*additional 1/3 letter grade\** will be deducted for each additional two days of late submission (including weekends). Questions? Ask! (Please do ask; deadlines are there to support your progress through the course, not to burden you.)

*Syllabus subject to change at instructors' discretion.*

## COURSE OVERVIEW

Week 1 Aug 24	<p><b><i>Introduction: Shared ground or methods in conflict?</i></b></p> <p><b>Primary:</b> Hersey and Vetter, “Shared Ground: Between Environmental History and the History of Science”</p>
Week 2 Aug 31	<p><b><i>Ecology and its technologies</i></b></p> <p><b>Primary:</b> Creager, <i>Life Atomic</i>; Gadgil and Guha, <i>This Fissured Land</i>, prologue and chapter 1</p> <p><b>Supplementary:</b> Tansley, “Use and Abuse”; Sörlin and Wormbs, “Environing Technologies: A Theory of Making Environment.”</p>
Week 3 Sept 7	<p><b><i>Mining: materials and words</i></b></p> <p><b>Primary:</b> Bigelow, <i>Mining Language</i>; LeCain, <i>The Matter of History</i>, chapters 1, 3, 6.</p> <p><b>Supplementary:</b> Hecht, <i>Being Nuclear</i> (introduction); Merchant, <i>The Death of Nature</i> (introduction and peruse).</p>
Week 4 Sept 14	<p><b><i>Forests, plantations, and weeds</i></b></p> <p><b>Primary:</b> Aso, <i>Rubber and the Making of Vietnam</i>; Tsing, <i>Friction</i> (introduction and chapter 5); McKittrick, “On plantations.”</p> <p><b>Supplementary:</b> Haraway, “Anthropocene, Capitalocene, Plantationocene, Chthulucene”; “The Plantationocene Series”</p>
Week 5 Sept 21	<p><b><i>Green revolutions and metabolic histories</i></b></p> <p><b>Primary:</b> Cushman, <i>Guano and the Opening of the Pacific World</i>; Kumar et al., “Roundtable: New Narratives of the Green Revolution”; Landecker, “A Metabolic History of Manufacturing Waste”</p> <p><b>Supplementary:</b> Melillo, “The First Green Revolution;” Ekstrand, “Award ceremony speech [Haber],” Borlaug, “The Green Revolution, Peace, and Humanity (Nobel Lecture),” Shiva, <i>The Violence of the Green Revolution</i>, chapter 1.</p>
Week 6 Sept 28	<p><b><i>Environmental biographies in the US South &amp; Global South</i></b></p> <p><b>Primary:</b> Hersey, <i>My Work is That of Conservation</i>; Soto Laveaga, “<i>Largo Dislocare</i>”</p> <p><b>Supplementary:</b> Spears, <i>Baptized in PCBs</i> (peruse); Vasudevan, “Intimate Inventory”; Woods, <i>Development Arrested</i>; Soto Laveaga and Gómez, “Thinking with the World”</p>
Week 7 Oct 5	<p><b><i>FALL BREAK; work on project proposals and bibliography</i></b></p>

*Syllabus subject to change at instructors' discretion.*

Week 8 Oct 12	<p><b><i>Food and famine</i></b></p> <p><b>Primary:</b> Saraiva, <i>Fascist Pigs</i>; Creager and Gaudillière, ed., <i>Risk on the Table</i>, introduction</p> <p><b>Secondary:</b> Peruse recent, most-cited, and most-viewed articles in <i>Food, Culture, and Society</i> and <i>Global Food History</i>; Spary, <i>Feeding France</i> (introduction); Creager and Gaudillière, <i>Risk on the Table</i> (peruse)</p>
Week 9 Oct 19	<p><b><i>Small technologies: Household sciences, environments, &amp; globalities</i></b></p> <p><b>Primary:</b> Lean, <i>Vernacular Industrialism in China</i>; Werrett, <i>Thrifty Science</i> (intro and chapter 3)</p> <p><b>Supplementary:</b> Edgerton, <i>The Shock of the Old</i>; Arnold, <i>Everyday Technology</i> (intro &amp; peruse); Ramaswamy, <i>Terrestrial Lessons</i> (prologue, chapters 1 &amp; 4).</p>
Week 10 Oct 26	<p><b><i>Oceans I: Knowing the ocean</i></b></p> <p><b>Primary:</b> Oreskes, <i>Science on a Mission</i>; Ingersoll, <i>Waves of Knowing</i>, introduction and peruse.</p> <p><b>Supplementary:</b> Rozwadowski, <i>Fathoming the Ocean</i> (peruse)</p>
Week 11 Nov 2	<p><b><i>Envirotechnical systems, disasters, and technopolitics</i></b></p> <p><b>Primary:</b> Zhang, <i>The River, the Plain, and the State</i>; Pritchard, <i>Confluence</i>, introduction and chapter 3.</p> <p><b>Supplementary:</b> Knowles, <i>Disaster Experts</i> (peruse); Hecht, <i>Radiance of France</i> (introduction)</p>
Week 12 Nov 9	<p><b><i>Waters, lands, peoples, and human kinds</i></b></p> <p><b>Primary:</b> King, <i>The Black Shoals</i>; Milam, <i>Creatures of Cain</i>, general intro (pp. 1-15), intro to Part III, &amp; chapter 9; Kimmerer, <i>Braiding Sweetgrass</i>, 3-10, 205-215 (&amp; peruse)</p> <p><b>Supplementary:</b> Liboiron, <i>Pollution is Colonialism</i>, introduction and chapter 3 ("An anticolonial pollution science"); Byrd, <i>The Transit of Empire</i> (peruse)</p>
Week 13 Nov 16	<p><b><i>Oceans II: Oceanic histories and "wet ontologies"</i></b></p> <p><b>Primary:</b> Duara, "Oceans as the Paradigm of History," <i>Theory, Culture &amp; Society</i> + TBD</p>
Week 14 Nov 23	<p><b><i>Unseen, undone, uncertain **OPTIONAL session + readings**</i></b></p> <p><b>Primary:</b> Murphy, <i>Sick Building Syndrome</i>, intro and epilogue; Boudia et al., <i>Residues</i>, introduction; Frickel and Elliot, <i>Sites Unseen</i>, introduction</p>
	<b><i>**Final papers/projects due by end of day, Mon Dec 13**</i></b>

*Syllabus subject to change at instructors' discretion.*

## DETAILS AND FURTHER READING

### Week 1: Introduction: Shared ground or methods in conflict?

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*Primary:*

- Mark D. Hersey and Jeremy Vetter, "Shared Ground: Between Environmental History and the History of Science," *History of Science* 57, no. 4 (November 1, 2019): 403–40.

### Week 2: Ecology and its technologies

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*Primary:*

- Angela N. H. Creager, *Life Atomic: A History of Radioisotopes in Science and Medicine* (Chicago: University of Chicago Press, 2013).
- Madhav Gadgil and Ramachandra Guha, *This Fissured Land: An Ecological History of India* (New York: Oxford University Press, 2013).

*Supplementary:*

- Sverker Sörlin and Nina Wormbs, "Environing Technologies: A Theory of Making Environment," *History and Technology* 34, no. 2 (2018): 101–25.
- A. G. Tansley, "The Use and Abuse of Vegetational Concepts and Terms," *Ecology* 16, no. 3 (1935): 284–307.

*Further reading:*

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### Week 3: Mining: materials and words

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*Primary:*

- Allison Margaret Bigelow, *Mining Language: Racial Thinking, Indigenous Knowledge, and Colonial Metallurgy in the Early Modern Iberian World* (Chapel Hill: Omohundro Institute and UNC Press, 2020).
- Timothy J. LeCain, *The Matter of History: How Things Create the Past* (New York: Cambridge University Press, 2017).

*Supplementary:*

- Gabrielle Hecht, *Being Nuclear: Africans and the Global Uranium Trade* (Cambridge, MA: MIT Press, 2012).
- Carolyn Merchant, *The Death of Nature: Women, Ecology, and the Scientific Revolution* (New York: Harper & Row, 1989).

*Further reading:*

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*Syllabus subject to change at instructors' discretion.*

## Week 4: Forests, plantations, weeds

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### Primary:

- Michitake Aso, *Rubber and the Making of Vietnam: An Ecological History, 1897-1975* (Chapel Hill: University of North Carolina Press, 2018).
- Anna Lowenhaupt Tsing, *Friction: An Ethnography of Global Connection* (Princeton: Princeton University Press, 2005).
- Katherine McKittrick, "On Plantations, Prisons, and a Black Sense of Place," *Social & Cultural Geography* 12, no. 8 (December 2011): 947–63.

### Supplementary:

- Donna Haraway, "Anthropocene, Capitalocene, Plantationocene, Chthulucene: Making Kin," *Environmental Humanities* 6, no. 1 (May 1, 2015): 159–65.
- Laura Perry and Addie Hopes, ed., "The Plantationocene Series," *Edge Effects* (2019-2021), <https://edgeeffects.net/plantationocene-series-plantation-worlds/>

### Further reading:

- Robert B. (III) Outland, *Tapping the Pines: The Naval Stores Industry in the American South* (Baton Rouge: LSU Press, 2004)
- Michael T. Taussig, *Shamanism, Colonialism, and the Wild Man: A Study in Terror and Healing* (Chicago: University of Chicago Press, 1986).
- Gregg Mitman, *Empire of Rubber: Firestone's Scramble for Land and Power in Liberia* (New York: New Press, 2021).
- Prakash Kumar, *Indigo Plantations and Science in Colonial India* (New York: Cambridge University Press, 2012).
- James C. Scott, *Seeing like a State: How Certain Schemes to Improve the Human Condition Have Failed* (New Haven: Yale University Press, 1998).
- Julie Guthman, *Agrarian Dreams: The Paradox of Organic Farming in California*, (Berkeley: University of California Press, 2004).
- Julie Guthman, *Wilted: Pathogens, Chemicals, and the Fragile Future of the Strawberry Industry* (Oakland, CA: University of California Press, 2019).

## Week 5: Green revolutions and metabolic histories

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### Primary:

- Gregory T. Cushman, *Guano and the Opening of the Pacific World: A Global Ecological History* (New York: Cambridge University Press, 2013).
- Prakash Kumar et al., "Roundtable: New Narratives of the Green Revolution," *Agricultural History* 91, no. 3 (2017): 397–422.
- Hannah Landecker, "A Metabolic History of Manufacturing Waste: Food Commodities and Their Outsides," *Food, Culture & Society* 22, no. 5 (2019): 530–47.

*Syllabus subject to change at instructors' discretion.*

*Supplementary:*

- Edward D. Melillo, "The First Green Revolution: Debt Peonage and the Making of the Nitrogen Fertilizer Trade, 1840—1930," *The American Historical Review* 117, no. 4 (2012): 1028–60.
- Å.G. Ekstrand, "Award Ceremony Speech (Haber)," NobelPrize.org, June 1, 1920, <https://www.nobelprize.org/prizes/chemistry/1918/ceremony-speech/>.
- Norman Borlaug, "Nobel Lecture: The Green Revolution, Peace, and Humanity," (Dec 11, 1970), <https://www.nobelprize.org/prizes/peace/1970/borlaug/lecture/>
- Vandana Shiva, *The Violence of the Green Revolution: Third World Agriculture, Ecology, and Politics* (The University Press of Kentucky, 2016 [1989]).

*Further reading:*

- Joppe van Driel and Lissa Roberts, "Circulating Salts: Chemical Governance and the Bifurcation of 'Nature' and 'Society,'" *Eighteenth-Century Studies* 49, no. 2 (2016): 233–63.
- Sigrid Schmalzer, *Red Revolution, Green Revolution: Scientific Farming in Socialist China* (University of Chicago Press, 2016).
- David Biggs, "Following Dioxin's Drift: Agent Orange Stories and the Challenge of Metabolic History," *International Review of Environmental History* 4, no. 1 (May 4, 2018): 7–31.

**Week 6: Environmental biographies in the US South & Global South**

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*Primary:*

- Mark Hersey, *My Work Is That of Conservation: An Environmental Biography of George Washington Carver* (Athens: University of Georgia Press, 2011).
- Gabriela Soto Laveaga, "Largo Dislocare: Connecting Microhistories to Remap and Recenter Histories of Science," *History & Technology* 34, no. 1 (March 2018): 21–30.

*Supplementary:*

- Ellen Griffith Spears, *Baptized in PCBs: Race, Pollution, and Justice in an All-American Town* (Chapel Hill: The University of North Carolina Press, 2014).
- Pavithra Vasudevan, "An Intimate Inventory of Race and Waste," *Antipode*, accessed September 28, 2019, <https://doi.org/10.1111/anti.12501>.
- Clyde Woods, *Development Arrested: The Blues and Plantation Power in the Mississippi Delta* (New York: Verso, 1998).

*Further reading:*

- Deborah Kay Fitzgerald, *Every Farm a Factory: The Industrial Ideal in American Agriculture* (New Haven: Yale University Press, 2003).
- Gabrielle Hecht, "Interscalar Vehicles for an African Anthropocene: On Waste, Temporality, and Violence," *Cultural Anthropology* 33, no. 1 (2018): 109–41.

*Syllabus subject to change at instructors' discretion.*

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**Week 8: Food and famine**

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*Primary:*

- Tiago Saraiva, *Fascist Pigs: Technoscientific Organisms and the History of Fascism* (Cambridge, MA: MIT Press, 2016).
- Jean-Paul Gaudillière and Angela N. H. Creager, eds., *Risk on the Table : Food Production, Health, and the Environment* (New York: Berghahn Books, 2021).

*Supplementary:*

- E. C. Spary, *Feeding France: New Sciences of Food, 1760-1815* (New York: Cambridge University Press, 2014).

*Further reading:*

- Steven Shapin, “‘You Are What You Eat’: Historical Changes in Ideas about Food and Identity,” *Historical Research* 87, no. 237 (August 1, 2014): 377–92.

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**Week 9: Small technologies: Household sciences, environments, & globalities**

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*Primary:*

- Simon Werrett, *Thrifty Science: Making the Most of Materials in the History of Experiments* (Chicago: University of Chicago Press, 2019).
- Eugenia Lean, *Vernacular Industrialism in China Local Innovation and Translated Technologies in the Making of a Cosmetics Empire, 1900-1940* (New York: Columbia University Press, 2020).

*Supplementary:*

- David Edgerton, *The Shock of the Old: Technology and Global History since 1900* (New York: Oxford University Press, 2007).
- David Arnold, *Everyday Technology: Machines and the Making of India's Modernity* (Chicago: University of Chicago Press, 2013).

*Further reading:*

- Lissa L. Roberts and Simon Werrett, eds., *Compound Histories: Materials, Governance and Production, 1760-1840* (Leiden: Brill, 2018).
- Sumathi Ramaswamy, *Terrestrial Lessons: The Conquest of the World as Globe* (Chicago: University of Chicago Press, 2017).

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**Week 10: Oceans I: Knowing the ocean**

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*Primary:*

- Naomi Oreskes, *Science on a Mission: How Military Funding Shaped What We Do and Don't Know about the Ocean* (Chicago: University of Chicago Press, 2021).
- Karin Amimoto Ingersoll, *Waves of Knowing: A Seascape Epistemology* (Durham: Duke University Press, 2016).

*Supplementary:*

*Syllabus subject to change at instructors' discretion.*



- Helen M. Rozwadowski, *Fathoming the Ocean: The Discovery and Exploration of the Deep Sea* (Cambridge, MA: Belknap Press, 2005). (No Duke e-book, I believe.)

*Further reading:*

- D. Graham Burnett, *The Sounding of the Whale: Science & Cetaceans in the Twentieth Century* (Chicago: University of Chicago Press, 2012)
- Kristin A. Wintersteen, *The Fishmeal Revolution: The Industrialization of the Humboldt Current Ecosystem* (Oakland, CA: University of California Press, 2021).

### **Week 11: Envirotechnical systems, disasters, and technopolitics**

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*Primary:*

- Ling Zhang, *The River, the Plain, and the State: An Environmental Drama in Northern Song China, 1048-1128* (New York: Cambridge University Press, 2016).
- Sara B. Pritchard, *Confluence: The Nature of Technology and the Remaking of the Rhône* (Cambridge, MA: Harvard University Press, 2011).

*Supplementary:*

- Scott Gabriel Knowles, *The Disaster Experts: Mastering Risk in Modern America* (Philadelphia: University of Pennsylvania Press, 2011).
- Gabrielle Hecht, *The Radiance of France: Nuclear Power and National Identity after World War II*, Inside Technology (Cambridge, Mass.: MIT Press, 1998).

*Further reading:*

- Timothy Mitchell, *Rule of Experts: Egypt, Techno-Politics, Modernity* (Berkeley: University of California Press, 2002).
- Kim Fortun, *Advocacy after Bhopal: Environmentalism, Disaster, New Global Orders* (Chicago: University of Chicago Press, 2001).

### **Week 12: Waters, lands, peoples, and human kinds**

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*Primary:*

- Tiffany Lethabo King, *The Black Shoals: Offshore Formations of Black and Native Studies* (Durham: Duke University Press, 2019).
- Erika Lorraine Milam, *Creatures of Cain: The Hunt for Human Nature in Cold War America* (Princeton: Princeton University Press, 2019).
- Robin Wall Kimmerer, *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge and the Teachings of Plants* (Milkweed Editions, 2013).

*Supplementary:*

- Max Liboiron, *Pollution Is Colonialism* (Durham: Duke University Press, 2021).
- Jodi A. Byrd, *The Transit of Empire: Indigenous Critiques of Colonialism* (Minneapolis: University of Minnesota Press, 2011).

*Further reading:*

*Syllabus subject to change at instructors' discretion.*

- Donna Haraway, *Primate Visions: Gender, Race, and Nature in the World of Modern Science* (New York: Routledge, 1989).

### **Week 13: Oceans II: Oceanic histories and “wet ontologies”**

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*Primary:*

- Prasenjit Duara, “Oceans as the Paradigm of History,” *Theory, Culture & Society*, February 8, 2021, 0263276420984538.

*Supplementary:*

- Prasenjit Duara, *The Crisis of Global Modernity: Asian Traditions and a Sustainable Future* (New York: Cambridge University Press, 2015).

*Further reading:*

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### **Week 14: Unseen, undone, uncertain**

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*Primary:*

- Michelle Murphy, *Sick Building Syndrome and the Problem of Uncertainty: Environmental Politics, Technoscience, and Women Workers* (Durham: Duke University Press, 2006).
- Soraya Boudia et al., *Residues: Thinking through Chemical Environments* (New Brunswick: Rutgers University Press, 2022).
- Scott Frickel and James R. Elliott, *Sites Unseen: Uncovering Hidden Hazards in American Cities* (New York: Russell Sage Foundation, 2018).

*Supplementary:*

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*Further reading:*

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## OTHER TOPICS

### Fiction

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- N.K. Jemisin, *The Fifth Season* (+ *Broken Earth* series sequels); Powers, *The Overstory*; Powers, *Gain*; Atwood, *Oryx and Crake* (+ *Maddaddam* series sequels)

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### Policy

Selcer, *Postwar Origins*

Rothschild, *Poisonous Skies*

### Animals and breeding

Woods, *The Herd Shot Round the World*

### Pollution and purity

Liboiron, *Pollution is Colonialism* (Norton, *Sacred Gifts, Profane Pleasures?* Guha, *The Fissured Land?* Grove, *Green Imperialism?* Park and Pellow, *The Slums of Aspen?* Tsing, *The Mushroom at the End of the World?*)

### Circulation

*Syllabus subject to change at instructors' discretion.*

Kapil Raj, *Relocating Modern Science*

Cook, *Matters of Exchange*; Norton, *Sacred Gifts, Profane Pleasures*