Rachel Carson Center
Perspectives

Crossing Mountains

The Challenges of Doing Environmental History

Edited by
MARCUS HALL
PATRICK KUPPER

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Introduction

Challenges in Environmental History

In August 2013, some 25 young academics and senior scholars gathered in Switzerland's Lower Engadine for the fourth European Society for Environmental History (ESEH) Summer School, an event supported by the Rachel Carson Center for Environment and Society (RCC).[1] "Mountains across Borders" was the subject chosen, which resonated well with the venue: the small Alpine town of Lavin, situated near the borders of both Austria and Italy. The school's goal was bold, namely, to "identify the best ways of *doing* environmental history, using mountains and transboundaries as points of departure." While PhD students and post-docs were asked to present their ongoing research projects, senior scholars were invited to focus on "what they see as the main challenges of doing research and producing a compelling product, with examples drawn from their own work and experience."[2] We assumed that having senior scholars reflecting on their work in this way, merging personal experience and professional challenges, would be of particular interest to PhD students and junior scholars. Feedback by the participants proved that we were right, which encouraged us to share at least some of our insights and discussions in Lavin with a wider public.

This issue of *RCC Perspectives* contains revised versions of six of the contributions first presented to the summer school in Lavin.[3] Their geographical reach is vast, including major mountain ranges of five continents: the Alps, the Chinese mountains and the Himalayas, East Africa's highlands, the Andes, and the Rocky Mountains. Recurring themes include accessing remote areas and coping with difficult local settings, crossing borders and practicing cross-cultural communication, gauging personal motivation and adhering to professional standards, and framing research projects and questions while reaching out to various kinds of publics. Taken together, they offer a guidebook to the challenges that environmental historians might face in their work, in mountain regions and beyond.

1 The other sponsors were the University of Zurich, ETH Zurich, International Association for Alpine History (IAAH), and ESEH.
2 Call for Applications, http://eseh.org/wp-content/uploads/Mountain.Summer.School.pdf, accessed 4 May 2014.
3 For a review of all presentations see the report by Rosalinda Ruiz Scarfuto, http://eseh.org/wp-content/uploads/REPORT-ESEH-Summer-School.pdf, accessed 4 May 2014.

The six contributions can be roughly divided into three sections. In the first section, Philippe Forêt and Emily Wakild reflect on crucial and at times unexpected or neglected challenges to projects in environmental history. They take their work on mountains in the Far East and Latin America, respectively, as a starting point to wrestle with conceptual challenges to be confronted in any historical research project, focusing on changing contexts and the resultant omission of data (Forêt), and on crucial issues of scale in designing and carrying out a project (Wakild). Their essays offer insight into structural and environmental factors that inevitably shape the study of history.

The second section deals with the challenge of researching across cultural borders, while also providing an experimental interlude between the more formal essays at the beginning and end of the volume: writing in the form of an informal conversation, Mei Xueqin and Jon Mathieu discuss Chinese mountains and the challenges they pose to the researcher. Mathieu included China in his recent book on the comparative history of mountains, yet regretted his lack of linguistic skills which prevented him from reading Chinese sources. Xueqin, an expert on industrialization, is well versed in the cultural tradition of these mountains and knows the regions first-hand. From their conversation a cross-cultural dialogue evolves, suggesting the benefits of making environmental history truly global and integrating a variety of local perspectives.

Contributions by Richard Tucker, Chris Conte, and Marcus Hall comprise the final section. Tucker and Conte write about their experiences researching in the mountainous areas of India and Eastern Africa, respectively, and the challenges they confronted. Their essays offer rich first-hand accounts of what it means to work as a Western historian in those non-Western settings. Like Tucker and Conte, Hall also includes his own background as an important factor in his research. He includes the scholar's personal background alongside questions of cultural, institutional, and professional context in an attempt to give a more complete picture of the challenges involved in doing research. Finally, Hall returns to the specific situation faced by the young scholars at the 2013 ESEH Summer School in Switzerland. While acknowledging the challenges, he also dwells on the rewards of a project well done and the potential benefits offered by the anecdotes and insights collected in this volume.

All of these essays emphasize the cultural, archival, and geographic challenges of doing mountain environmental history, often revealing issues that extend to the pursuit of

Figure 1:
During an excursion to the Swiss National Park, the author describes the history of the park to students and colleagues. The excursion was part of the 2013 ESEH summer school "Mountains Across Borders" in Lavin, Switzerland.

environmental history in any landscape. The essays thus form a guidebook that might help scholars to navigate the proverbial landslides, river crossings, and poorly marked trails that characterize the metaphorical mountains of environmental history research. But as these contributions also show, rising to these challenges is not only necessary but also very rewarding. To a great extent, our motivation in collecting these essays has been driven by our hope to give some guidance to young and, perhaps also, more experienced colleagues in traversing the professional terrain of environmental history.[4]

4 We would like to thank all participants of our 2013 summer school and especially the authors of this issue for reworking their papers, as well as the Rachel Carson Center and its editors—in particular Seth Peabody, Katie Ritson, and Christof Mauch—for their help in preparing this publication.

Philippe Forêt

Challenges to Fieldwork before 1914 and Today: Adaptation, Omission, Rediscovery

Introduction

John Chappell and, before him, Lord Curzon have reminded us that much can be gained from reviewing earlier writings and from listening to interruptions and silence.[1] In January 2010, I discovered with amazement a wealth of unpublished observations while scrutinizing the drafts of maps made by the productive and flamboyant Dr. Sven Hedin (1865–1952). Secluded for decades in the National Archives of Sweden, Hedin's precise information on the vegetation types, soil and water qualities, animal tracks, former shorelines, and abandoned settlements of Tibet and Xinjiang would have been valuable for the elaboration of a theory on climate change in extreme environments.

We could find in these archives an instance of "lipography," a word I have coined after George Perec's notion of the "lipogram," referring to a text in which one letter of the alphabet is intentionally excluded.[2] The lipographical suppression of fieldwork-based evidence is a deliberate operation that creates new constraints on the discipline, after which "everything becomes possible."[3] A lipographical map, for instance, is a topographical map that does not allow us to reconstruct the environmental history of the area surveyed because key information has been removed. A lipographical article is a publication in which the geographer compels him/herself (or feels compelled) to exclude one of the data sets gathered during fieldwork, not out of ignorance, but because of an awareness of the challenges I analyze below.

To discuss an unspectacular case of lipography in a field-based discipline that became systematic before World War I, let us consider the challenges we meet today compared to

1 John E. Chappell, Jr., "Climatic Pulsations in Inner Asia and Correlations between Sunspots and Weather," *Palaeogeography, Palaeoclimatology, Palaeoecology* 10, no. 2–3 (1971): 177–97; Curzon in John Walter Gregory, "Is the Earth Drying Up?," *The Geographical Journal* 43, no. 3 (1914): 313–18. George Nathaniel Curzon, the president of the Royal Geographical Society of London, was Viceroy of India (1898–1905) and Foreign Secretary (1919–1924). His first feat was the exploration of the sources of the Amu Darya River in the Pamir Mountains.

2 George Perec, "History of the Lipogram," in *Oulipo: A Primer of Potential Literature*, ed. Warren F. Motte (Chicago: Dalkey Archive Press, 1998), 97–99. Amounting to a sort of word game, lipograms often exclude very common letters. For example, a lipogram in English might involve an entire poem without the letter E.

3 Ibid., 107.

the challenges met by explorers a century ago. The Royal Geographical Society of London (RGS) used to play a leading role in conflicts over the kinds of geography and survey work that were deemed acceptable. Between 1870 and 1914, in order to distinguish themselves from travel writers, explorers, and colonial officials, the geographers of the RGS devised new rules for the assessment of discovery claims.[4] The second part of this paper examines how mountain explorers informed debate held at the RGS on climate and civilization. The debate, made public in 1907 by a doctoral student, caused much consternation among the "gentlemen of science," to whom climate was by definition stable.[5]

Five Challenges to Mountain Fieldwork Today

1. Physical Engagement

A comparison of the challenges in doing mountain fieldwork now, as compared to a century ago, would highlight several differences. The differences are seen less in tools (the ubiquitous GPS, cell phones, battery chargers, and Japanese instant soups) than in density: we cannot allow ourselves to disappear for years on end like Sven Hedin did in 1906–1908, nor can we slow down the pace of our motorcades because we want to finish a watercolor; the yak drivers of yesteryear, on the other hand, could easily wait. Our personal engagement with the terrain is therefore usually limited to a couple of intensive weeks in summer. This deprives us of the rich interactions explorers had with native informants one hundred years ago. In the field, we now ignore our illiterate Afghan chauffeurs, Tajik fixers, Pakistani cooks, and Nepalese sherpas. Rare are the geographers who bother to learn the languages of the Pamir Mountains and the dialects of the Tibetan plateau, for instance, in order to work on glacier depletion. The scientific travelers whom the RGS used to criticize for their lax professional ethics have become academics who are Facebook and Instagram addicts. We never really find ourselves "here" or "there," since we remain dependent on communication with the outside world.

2. Logistics

Today, major challenges occur before, not during or after, the field season. The only reviews that really matter to us are those of our project proposals: "How will my review of

4 Peter Collier and Rob Inkpen, "The Royal Geographical Society and the Development of Surveying, 1970–1914," *Journal of Historical Geography* 29, no. 1 (2003): 93–108.

5 Freeman Dyson, "The Question of Global Warming," *The New York Review of Books* 55, no. 10 (12 June 2008).

the state of the field be reviewed?" One century ago proposals were not reviewed, but post-factum results were—maps, lectures with magic lanterns, and publications in society journals. Mountain fieldwork has always been an expensive activity, even if we no longer need to buy a pack of goats to feed our team for the next three months. The biggest differences I see in today's challenges lie in funding agendas, mechanisms, and scheduling. Rather than originality, funding agencies generally review proposals for reliability, accountability, and predictability. Administrative requirements, combined with cutthroat competition, have actively discouraged the articulation of new and risky ideas that would come from the patient probing of a terrain. Of course we can choose between private foundations and support from state and intra-governmental institutions, each with its own set of priorities. One hundred years ago, I would have turned to the Nobel family in Saint Petersburg or King Oscar II for help, or (being French) to the Ministère de l'Instruction publique. Presumably they would have been interested in hearing more about outcomes (glory and progress) than about processes (frameworks and leading questions).

3. Reviewers

Since the publication of the fifth IPCC assessment report rekindled the debate on observed and projected climate change, we have developed an appreciation for the instability of the Holocene and a willingness to reconsider climate's salient role.[6] Raising the level of the debate is probably all that can be expected from historians and geographers.[7] Rediscovering Ellsworth Huntington's theory and confronting Hedin's data raises uncomfortable questions, not so much about the mountains of Asia, but rather about the nature of scientific knowledge. Huntington's popular *Civilization and Climate* led to the recognition by the general public of a direct link between climate and history five decades before physicists noted changes in the chemistry of the atmosphere.[8] Asking what the consensus on climate change was in 1914, or is in 2014, amounts to asking why science is generally slow at accepting positive claims, rich in disagreements, skeptical of new sources and ancient modes of knowledge production, and subject to being hijacked by today's dominant discourse, replete with clichés, metaphors, models, rituals, and "key reports."[9]

6 Neville G. Brown, *History and Climate Change: A Eurocentric Perspective* (London: Routledge, 2001), 289.

7 Quoted from Albert Hirschman's *The Passions and the Interests* in Freeman Dyson, "The Question of Global Warming: An Exchange," *The New York Review of Books* 55, no. 14 (25 September 2008).

8 Ellsworth Huntington, *Civilization and Climate* (New Haven: Yale University Press, 1915).

9 Maria Ivanova, review of *The Science and Politics of Global Climate Change,* by Andrew E. Dessler and Edward Parson, *Global Environmental Politics 7,* no. 2 (2007): 145–47. See also Bill McKibben, "Can Anyone Stop It?," *The New York Review of Books* 54, no. 15 (11 October 2007).

4. Audience

Finding experts who are tolerant of dissident approaches and exotic topics would be a major challenge. The professional publications and internal discussions that follow mountain expeditions are crucial for the creation of a community of experts.[10] The quality of the work done in the field has been challenged by shifting standards in knowledge production, data integrity, and academic accountability elaborated by diverging disciplines. This explains why the contents of early twentieth-century scientific reports and expedition accounts have remained largely ignored.[11] The educated public may nevertheless find value in a discussion of a neglected body of literature that could present tantalizing insights on today's state of climate research.[12] Reaching that audience directly is another challenge.

5. Ongoing Relevance

A lunar crater has been named after Sven Hedin. Humans have not set foot on the moon since 1972, when this mission brought back rock samples. Four years ago these rocks were analyzed for evidence of graphite, a quest that Harrison Schmitt of Apollo 17 had certainly not envisioned. Samples yielded discrete pockets of graphite that astrobiologists believe to be the remnants of an intensive bombardment of meteorites four billion years ago. With the use of new methods, the resources of the Apollo program appear far from exhausted.[13] We might say the same about the scientific data gathered by the explorers who crisscrossed the highest mountains of our planet in the early 1900s. Here would be our last challenge: through geo-information techniques, make these collections relevant for our current research on climate change. Digitization projects being carried out in London and Stockholm have already begun to take on this challenge.[14]

Five Challenges to Mountain Fieldwork One Century Ago

The debate about climate variability that Eduard Brückner, Julius Hann, and Svante Arrhenius (the Swedish Nobel Prize winner who discovered the greenhouse effect)

10 On "epistemic community," see Pierre Bourdieu, *Science de la science et réflexivité: Cours du Collège de France, 2000–2001* (Paris: Editions raisons d'agir, 2001), 77–90.
11 For information on the challenges of the fieldwork being currently done on the environmental history of the mountains of Inner Asia, please visit Lars Larsson's website, http://svenhedin.com/.
12 Nico Stehr and Hans von Storch, eds., *Eduard Brückner: The Sources and Consequences of Climate Change and Climate Variability in Historical Times* (Dordrecht: Kluwer Academic Publishers, 2000), 18.
13 John Matson, "Lunar Pencil Lead," *Scientific American*, September 2010, 9.
14 See "The Silk Road Online," British Library International Dunhuang Project (IDP), http://idp.bl.uk/.

launched around 1890 remained apparently confined to a German-speaking circle of academics who had studied glaciation in the German and Swiss Alps. In 1888 Eduard Brückner had made deductions from fluctuations of the Caspian Sea, a region whose steppes Piotr Kropotkin had already investigated for clues on climate history.[15] Although comparisons were quickly made with the American Southwest, the Sahara, and the Levant, the evidence on past climates was first collected in Inner Asia.[16]

1. Funding

The turn of the twentieth century saw many expeditions undertaken to survey the topography of Iran, Xinjiang, and Tibet, as well as the formidable Pamir, Trans-Himalayan (Gangdise), and Kunlun Mountains.[17] The financial, logistical, and technical support for mountain fieldwork, which came from imperial agencies, made possible extensive journeys that provided the topographical data that were critical to new theories on climate change and the reconstruction of unexpected sequences of catastrophic events.[18] Unlike researchers today, scientists a century ago could not apply to a range of funding sources. However, once they were able to secure patronage, the support made possible extensive journeys without any supervision.

2. Methods

The publications of notes, results, and travelogues that portrayed "Old Lands and New Conditions" quickly followed upon the return of their expeditions to civilization. Sven Hedin, Ellsworth Huntington, and Aurel Stein were prodigious writers who relied on local informants they thoroughly quizzed.[19] The challenges they had met were initially related to the heterogeneous concepts, tools, and practices used to collect and process information on environmental change in specific locales. Patient measuring, counting, mapping, excavating, good luck, and their intimate familiarity with the terrain and native languages led explorers to reconstruct the history of vanished civilizations and specu-

15 Piotr Kropotkin, "The Desiccation of Eurasia," *The Geographical Journal* 23, no. 6 (1904): 722–34, and "The Desiccation of Eurasia: Discussion," 734–41.

16 Ellsworth Huntington, "Across the Ghor to the Land of Og," *Harper's Magazine*, March 1910, 667–78. See also Sven Hedin et al., "De vetenskapliga resultaten av våra expeditioner i Centralasien och Tibet 1927–1935," *Ymer* 4 (1935): 289–338.

17 For example, Sven Hedin's expeditions in 1894–1897, 1899–1902, and 1905–1908.

18 Svenska sällskapet för antropologi och geografi, eds., *Hyllningsskrift tillägnad Sven Hedin* (Stockholm: Generalstabens litografiska anstalt, 1935), 164.

19 In 1909–1910 alone, Hedin published *Transhimalaya* and *Öfver land till Indien*, totaling 2,385 pages. See: Sven Hedin, *Transhimalaya: upptäckter och äfventyr i Tibet* (Stockholm: Bonniers, 1909) and Öfver land till Indien genom Persien, Seistan och Belutjistan (Stockholm: Bonniers, 1910).

late on their complex relationships with nature. These explorers relied on various visual supports to record, organize, and preserve diaries, field notes, and data, which allowed them to make educated guesses when they surveyed archeological sites, like those of Loulan, that had chronicled societal collapse.

3. Results

The first small-scale maps of the oases of the Taklamakan and Gobi deserts, as well as watercolors of the terminal lakes of the Tibetan plateau, were significant because they highlighted physical features that defined the last 2,500 years of the climate and human history of Asia (fig 1). With their universal conventions for showing geographic features and elevations, maps were expected to provide definitive answers on the stability of natural conditions.[20] Through these maps, lake oscillation, climate pulsation, and soil desiccation shared the same methodology and visual language. Colleagues in Europe expressed their doubts about the reliability of techniques for ground route mapping and made fun of mountain maps that looked like skin diseases. The British Survey of India felt a need to make it known to the editors of *The Geographical Journal* that it did not share London's low opinion of route mapping. Although Hedin described his mapping methods at length his 1927 publication *Eine Routenaufnahme durch Ost-Persien*, the gap in the English-speaking literature on field cartography was closed only in 1957—too late to influence the debate and do justice to fieldwork research.[21]

4. Review

Back home, new challenges were awaiting the explorers of Asia: public lectures, discussions, questioning, and peer reviews by scholarly societies. In 1906, Ellsworth Huntington, then a student at Harvard, published a report in the *Geographical Journal* that confirmed Kropotkin's deductions on the historical pace of climate change. During his years of doctoral fieldwork in Persia and Turkestan, he had witnessed a process of desiccation, "which is the last faint undulation of the great climatic waves of the Glacial Period."[22] According to his *The Pulse of Asia: A Journey in Central Asia Illustrating the Geographic*

20 Sven Hedin, *Scientific Results of a Journey in Central Asia, 1899–1902*, vol. 2 (Stockholm: Generalstabens litografiska anstalt, 1905), 327.

21 Sven Hedin, *Eine Routenaufnahme durch Ost-Persien* (Stockholm: Generalstabens litografiska anstalt, 1918–1927). See also: Wilhelm Filchner, Erich Przybyllok, and Toni Hagen, *Route-Mapping and Position-Locating in Unexplored Regions* (New York: Academic Press, 1957).

22 Ellsworth Huntington, "The Rivers of Turkestan and the Desiccation of Asia," *The Geographical Journal* 28, no. 4 (1906): 353.

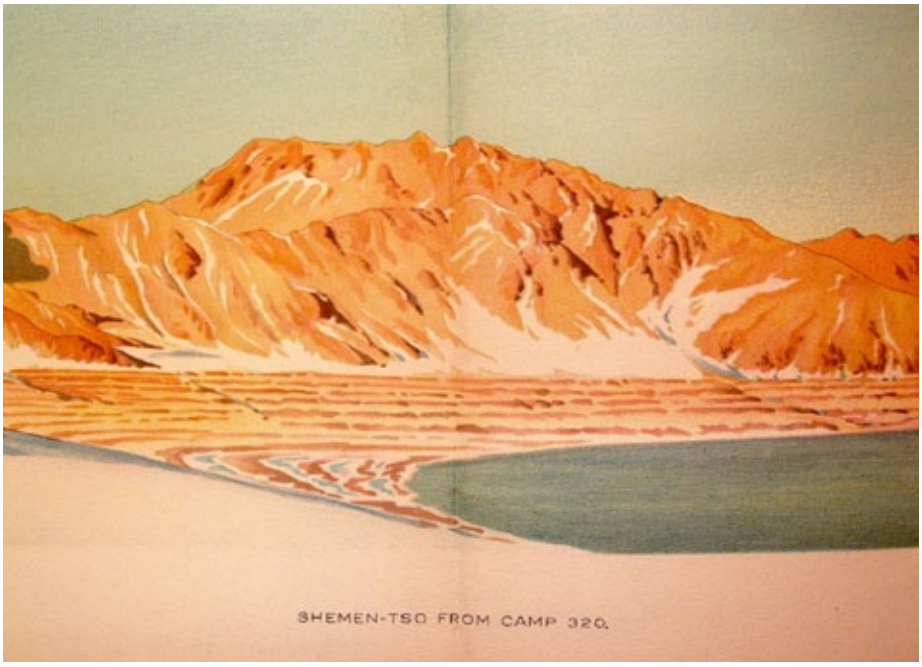

Figure 1:
"Shemen-tso from Camp 320," drawn on 4 February 1908 [detail]. To indicate the progressive desiccation of western Tibet, Sven Hedin drew the receding shorelines of Shemen-tso Lake (elevation: 4,960 m). Sven Hedin, *Southern Tibet Prospectus* (Stockholm: Lithographic Institute of the General Staff of the Swedish Army, 1922). Colored panorama taken from *Southern Tibet,* vol. 4, pages 240a and 240b. Photo courtesy of the Sven Hedin Foundation of the Royal Swedish Academy of Sciences.

Basis of History, not only was climate changing, but this change was global.[23] He rejected Hedin's notion of oscillation, which assumed that wind erosion alone could alter local topography.[24] Due to its wide generalizations (e.g., "with every throb of the climate pulse, which we have felt in Central Asia, the center of civilization has moved this way or that"[25]), *The Pulse of Asia* was poorly reviewed in London. Huntington demanded in vain that observations on lake elevations be connected to a thesis on climate change.[26] Unanswered, his question remained open for a while: was climate changing, and could we find an answer in the mountains and high plateaus of Asia?[27] In the winter of 1914, Prof. John Walter Gregory wondered aloud if the Earth was drying up.[28] By 1930 Gregory

23 Ibid., 365.
24 Ellsworth Huntington, "Lop-Nor. A Chinese Lake. Part II. The Historic Lake (Lop-Nor)," *Bulletin of the American Geographical Society* 39, no. 3 (1907): 141; Huntington, *The Pulse of Asia: A Journey in Central Asia Illustrating the Geographic Basis of History* (Boston: Houghton and Mifflin, 1907).
25 Huntington, *Pulse of Asia,* 385.
26 Ellsworth Huntington, review of *Trans-Himalaya: Discoveries and Adventures in Tibet,* by Sven Hedin, *Bulletin of the American Geographical Society* 42, no. 3 (1910): 217.
27 Thomas H. Holdich, review of *The Pulse of Asia,* by Ellsworth Huntington, *The Geographical Journal* 33, no. 4 (1909): 490–91.
28 John Walter Gregory, "Is the Earth Drying Up?," *The Geographical Journal* 43, no. 2 (1914): 148–72; no. 3, 293–318; no. 4, 451–59; and no. 6, 705–6.

had come to believe that the Altai Mountains were undergoing a progressive climate change and not a cyclical one.[29]

5. Significance

Welcomed as heroes, Sir Sven Hedin and Sir Aurel Stein were awarded Gold Medals by the RGS for their unexpected and carefully mapped discoveries of ancient Asia.[30] That said, academic Europe did not hide its prejudices about colonial Asia and the time-honored belief regarding the indolence of its populations.[31] Many scientists in Edwardian Britain, Wilhelmian Germany, and Belle Époque France viewed with dismay the ad hoc organization of explorers' expeditions, their political agendas, and the attention they enjoyed in the media and from the general public. Away from the field, the interpretation of maps, images, photographs, columns of figures, sketches, and landscape watercolors presented a challenge to reviewers. The entanglements of text and image, and of the scientific and artistic renditions of the landscape, were seen with disdain as not scientific enough; what could not be measured was often left out from the map (fig. 2). Even when they were meticulously documented, places located at the heart of Eurasia and therefore at the periphery of the British Empire were rarely considered as centers of credible scientific production.

Conclusion

Comparing pre-1914 challenges in mountain fieldwork to today's challenges could be done by situating in a wider context the relationship between geography, field methods, funding agencies, academic networks, and the equivalent to membership in the Hakluyt Society. The story of how we have forged our consensus on climate will remain incomplete as long as we ignore the contributions made by the scholars who carefully surveyed the desolate highlands of Asia and whose results we have silenced. Freeman Dyson asserted that the best way to understand science is to study the individual human

29 Reginald C. F. Schomberg, "The Climatic Condition of the Tarim Basin: Discussion," *The Geographical Journal* 75, no. 4 (1930): 320–23.

30 Philippe Forêt, *La véritable histoire d'une montagne plus grande que l'Himalaya: Les résultats scientifiques inattendus d'un voyage au Tibet (1906–1908) et de la querelle du Transhimalaya* (Paris: Bréal, 2004), 115–27.

31 François Herbette, "Le problème du dessèchement de l'Asie intérieure," *Annales de Géographie* 23, no. 127 (1914) : 1–30.

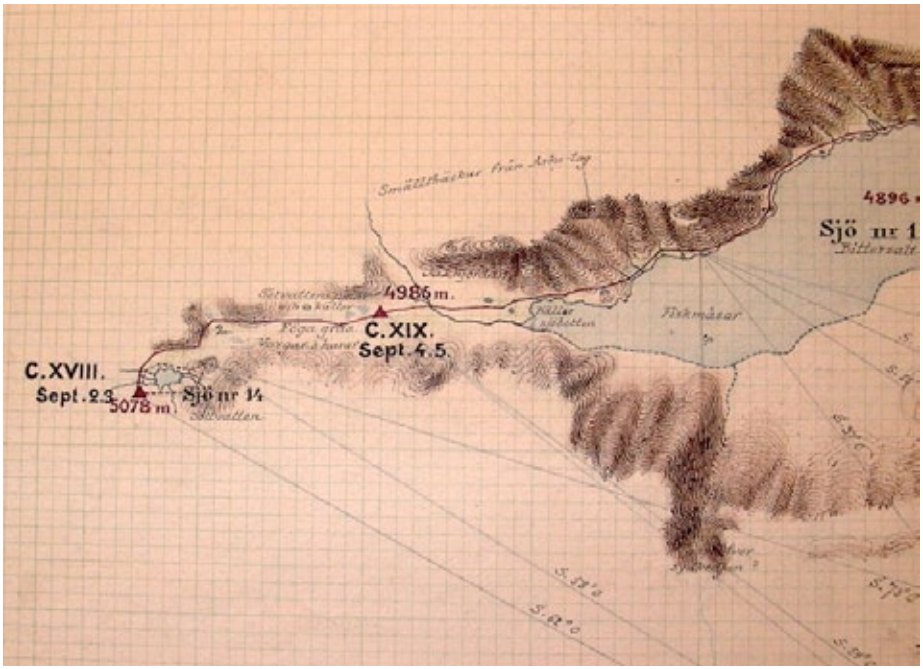

Figure 2: Detail of the untitled map draft made by C. J. O. Kjellström to illustrate the route along two unnamed lakes taken by Sven Hedin 2–8 September 1896. Initial data is checked, revised, and may be deleted as map editing progresses. The final sheet by H. Byström is accurate but may not convey information relevant to climate change. Sven Hedin, unpublished manuscript map of "From Camp Dalai-Kurghan to Camp XXXVI," and Sven Hedin, *Scientific Results of a Journey in Central Asia, 1899–1902* (Stockholm: Lithographic Institute of the General Staff of the Swedish Army, 1904–1907), vol. 8, sheets 80 and 81. Photo courtesy of the Sven Hedin Foundation of the Royal Swedish Academy of Sciences.

beings who practice it.[32] Dyson's comment can serve as a starting point if we wish to weave together personal memoirs, unpublished field notes, private letters and diaries, and maps and sketches, as well as scientific articles and public lectures.[33] As a genre, biographies, be they of individuals (Aurel Stein and Sven Hedin), of institutions (the RGS), or of concepts (climate pulse), offer a compelling way to present the emergence of theories, techniques, and practices.

The link between mountain lakes, weather patterns, societal collapse, and dramatic population decreases in the lowlands has been evidenced by recent techniques that have confirmed multi-centennial fluctuations—the isotopic analysis of stalagmites, for instance.[34] Such a link was first deducted using crude techniques that involved mules, chronometers, compass bearings, and drafting tables; these were part of the

32 Freeman Dyson, "The Scientist as Rebel," *The American Mathematical Monthly* 103, no. 9 (1996): 800–5.
33 Philippe Forêt et al., *La Haute-Asie telle qu'ils l'ont vue: Explorateurs et scientifiques de 1820 à 1940* (Geneva: Olizane, 2003). See also: Forêt, *La véritable histoire.*
34 Pingzhong Zhang et al., "A Test of Climate, Sun, and Culture Relationships from an 1810-Year Chinese Cave Record," *Science 322* (2008): 940–42.

systematic acquisition of knowledge that surveying methods would validate. We may better understand the history of knowledge about earth systems by examining how explorers tried to squeeze their findings into preconceived notions of what geography, mountains, and Asia ought to be. We would need a plain description of the concepts, techniques, values, and esprit de corps that have jointly influenced local fieldwork and global theorizing. This would help us address the challenges raised a century ago and in our own day, as we try to assess results from the field.[35]

35 For their generous assistance, I would like to express my thanks to Håkan Wahlquist and Staffan Rosén (Sven Hedin Foundation). A first draft of this paper was read on 20 August 2013 to the participants of the "Mountains across Borders" ESEH Summer School in Lavin, Switzerland, whose comments were encouraging. This paper expands on "The 21st Century Sven Hedin: Today's Assessment of Past Topographical Surveys in Central Asia" (Swedish Society of Geography and Anthropology meeting, Stockholm: 2013), and on "Climate Change: A Challenge to the Geographers of Colonial Asia" (*RFIEA Perspectives*, no. 9, http://rfiea.fr/articles/climate-change-challenge-geographers-colonial-asia), an article I wrote at the Institute for Advanced Study of Nantes.

Emily Wakild

The Challenge of Scale in Environmental History: A Small Meditation on a Large Matter[1]

Figure 1: Sierra Valdivieso, Tierra del Fuego, Argentina, 2011. Photo courtesy of the author.

How do historians balance exceptions against broader patterns to understand their significance? From the perspective of the image above, you can see the rising jagged peaks and the *nothofagus* forests below, but you do not catch a glimpse of the havoc exotic beavers have brought to the water coursing through peat bogs, nor are there indications that this range rises out of an island at the tip of South America. Mountains provide an illustrative way of thinking about historical scale. Setting and serendipity influence inhabiting communities that are molded by barriers and conduits the mountains create. But mountains alone don't explain how beavers ended up in Valdivieso. Mountains shape rather than determine the course of human history, and yet the contiguity of their features opens avenues of comparison, especially regarding time and space.[2] Instead of digging into their strata, let us consider mountains as metaphors for the challenges associated with the multiple levels of analysis an environmental history project might consider.

1 This essay is based on work supported by the US National Science Foundation under grant 1230911.
2 Jon Mathieu, "Long-Term History of Mountains: Southeast Asia and South America Compared," *Environmental History* 18, no. 3 (2013): 557–75.

Some of the most crucial decisions a historian makes to frame a project involve scales. Scale implies a comparison, ordering elements by size, position, population, or more. It also implies a panorama that glimpses each in turn. Historical approaches include provocative conceptualizations, such as borderlands, frontiers, and diasporas, that all invoke scales beyond the ordinary. Attention to the ways in which scale implicitly and explicitly shapes historical work sharpens the exactitude of historical questions without dulling the hatchet needed to cut through insignificance.[3]

Decisions about scale arise in any discipline. In environmental history, scale manifests in at least five ways: temporal, spatial, cultural, organismal, and organizational. In these brief remarks, I take each type in turn, offering unsystematic observations, frequently about Latin America. Too much research slips into easy narratives, seduced by habit and tradition; environmental history offers a promiscuous alternative. By surrendering to an explicit engagement with scale, we might escape to the mountains.

Temporal: Timing as Scale

When to begin? Traditional political or social histories rarely reach back to the formation of the landscape, let alone the shaping of the earth itself.[4] Histories, even of mountain areas, need not begin with tectonic plates, but historians must consider their implicit periodization. We have a more anarchic chronology than, say, geologists, as each historian can decide when to start and stop the story she tells. Historians often develop a timeline based on two or three metrics: an event (the Spanish civil war), a life (or set of lives—Darwin and his contemporaries), or a comfortably round time period (the 1960s or the long nineteenth century). Environmental history's commitment to incorporating nonhuman actors into the story of the human past opens different possibilities. While time is among the most forceful of natural elements, time is also a cultural and philosophical construction. Any segment of time is to some extent arbitrarily defined, even if it ties into daily, seasonal, or planetary

3 Alfred W. Crosby, "The Past and Present of Environmental History," *American Historical Review* 100, no. 4 (1995): 1177–89; Richard White, "The Nationalization of Nature," *Journal of American History* 86, no. 3 (1999): 976–86; Joseph E. Taylor, III, "Boundary Terminology," *Environmental History* 13 (2008): 454–81. For a full explication of the hatchet and seed metaphor, see Paul Robbins, *Political Ecology: A Critical Introduction* (Malden, MA: Blackwell, 2004), 3.

4 David Christian, *Maps of Time: An Introduction to Big History* (Berkeley: University of California Press, 2004).

rhythms.[5] To understand the influence of the past on the present, timescales beyond human construction need consideration. For instance, the life cycle of an *Anopheles* or *Aedes* mosquito is rarely more than a month, yet in their short lives they can impact human well-being through malaria and yellow fever infections. Tiny insects can disrupt human settlement, as they did across the Greater Caribbean, or even play formative roles in human warfare by conferring immunity on some populations or decimating others.[6]

What about the life cycles of plants? In the far western Amazon, near the rise of the Andes, reside stands of bamboo forest with bamboo "trees" (genus *Guadua*) that climb more than 20 meters vertically.[7] These forests cover an area (nearly 180,000 km²) three times the size of Costa Rica and dominate the least inhabited tropical areas in the world. Bamboo forests contain a range of compositions including naturally monocultural stands. Knowledge of their existence is relatively new to scientists; these giant stands were only identified by their mystifying appearance on LandSat images as extensive dark yellow patches, distinct from other lowland forests. Perhaps most intriguingly, these forests have a generational life cycle where the entire forest dies approximately every 26 years. What then happens to the animals and possibly even the human populations that inhabit these forests? Timescales of plants and animals matter in human affairs.

Another timescale to consider is the collective impact of humanity on planetary time. Reconceptualizing our current era as the "Anthropocene," as Noble Prize-winning chemist Paul Crutzen urges us to do, recognizes the interplay between human timescales and cycles of life that existed prior to the overwhelming influence of our species. Dipesh Chakrabarty deepened this observation in relation to history by pointing out the chronological implication that humankind, through the release of carbon gases and industrialization, has become not just a biological force on the planet but a *geological force*.[8] Choosing a timescale and hitching it to a world beyond humans, without being neglectful of human impacts, is a challenge for scaling up environmental history.

5 Adrian Bardon, *A Brief History of the Philosophy of Time* (New York: Oxford University Press, 2013).
6 John McNeil, *Mosquito Empires: Ecology and War in the Greater Caribbean, 1620–1914* (New York: Cambridge University Press, 2010).
7 Miles R. Silman, Emilio J. Ancaya, and James Brinton, "Los bosques de bambú en la Amazonía occidental," in *Alto Purus: Biodiversidad, Conservación, y Manejo*, ed. Renata Leite Pitman, Nigel Pitman, and Patricia Alvarez (Durham, NC: Center for Tropical Conservation Press, 2003).
8 Dipesh Chakrabarty, "The Climate of History: Four Theses," *Critical Inquiry* 35 (2009): 197–222.

Spatial: Beyond the Nation-State

Where does history take place? Spatial links, or geographical scale, ground the past in place. The natural features of any environment have influence on human lives, an observation not lost to geographers.[9] Ironically, the social and cultural turn in history unhinged histories of people from their geographical setting to the extent that studies of social relations lost their grounding.[10] Making sure histories take "place" is not as easy as it sounds. Many places—nation-states, for instance—do not exist along ecologically sensible parameters. At least seven nations contain the Alps, nine nations share the Amazon forest, and no less than ten nations, including the world's newest nation, South Sudan, claim portions of the Nile river. To look at this another way, ecological phenomena both predate and transcend convenient political boundaries.

Costa Rica has a reputation as a peaceful oasis of forward-looking environmental policy. Nearly 25 percent of the territory resides in a national park or other protected area (most countries average around 10 percent).[11] But all of the parks in Costa Rica would fit in a single soybean field in the Brazilian Amazon. In light of this, the challenge for environmental historians is to determine which place-based phenomena might supplement political or cultural frameworks. Then, we must consider how to employ them without losing (or reifying) the meaningful core, the nation-state. The options for spatial supplements abound. Watersheds, mountain ranges, deserts, and oceans form the most convenient of these frameworks: Mediterranean worlds, Andean cultures, trans-Saharan trades, and the Pacific Rim are among the most illustrative. Such place-based, geographical units push considerations of scale beyond expected configurations and open doors through which environmental historians might depart from the nation-state while still retaining meaningful concepts for comparison.

9 The kindred discipline of historical geography has grappled with this for much longer and to several extremes; for an overview see Thomas Lekan and Thomas Zeller, "Region, Scenery, Power: Cultural Landscapes in Environmental History," in *Oxford Handbook of Environmental History*, ed. Andrew Isenberg, forthcoming.

10 Christopher R. Boyer, *A Land between Waters: Environmental Histories of Modern Mexico* (Tucson: University of Arizona Press, 2012), 1–21.

11 Sterling Evans, *Green Republic: A Conservation History of Costa Rica* (Austin: University of Texas Press, 1999), 1–3. Not all assessments of Costa Rica are positive; for example, see John H. Vandermeer and Ivette Perfecto, *Breakfast of Biodiversity: The Political Ecology of Rain Forest Destruction* (New York: Food First Books, 1995).

Cultural Scales: Or, Numbers

How to measure culture? Historians are not known for their mathematical prowess, yet in the 1970s and 1980s many influential social historians had a quantitative side.[12] Prosopographies (collective biographies) and quantitative data sets effectively made the case for incorporating the voiceless, the undocumented, the "hidden histories" into larger understandings of societies across time and space.[13] This led in part to new innovations of deep textual analysis and the theoretical tracing of power through the construction of knowledge.[14] One effect was the cultural turn, which set adrift the natural world as just another manifestation of power to be deconstructed, and advocated returning to careful readings of fragmented texts, searching for underrepresented voices.[15] From here, numbers stepped aside as histories from below modified master narratives by reading against the grain. This served as an important corrective, and an expansive view of humanity emerged. And yet the inverse is also apparent. If single, ephemeral glimpses revise our histories, how do we account for overwhelming trends?

Numbers matter, and the ratios and scales of those numbers are relevant, but often tricky, considerations for scholars. Scales of humanity, using raw population numbers, offer a sense of perspective not available elsewhere. In the 1959 introduction to his study of the urban poor in Mexico City, the US anthropologist Oscar Lewis pointed to the irony of his discipline's predilection for the remote and rare. As a result, he argued, many Americans "know more about the culture of some isolated tribe of New Guinea, with a total population of 500 souls, than about the way of life of millions of villagers in India or Mexico and other underdeveloped nations which are destined to play so crucial a role in the international scene."[16] Demographic scales should matter in historians' attempts to account for collective experiences.

12 Peter Novick, *That Noble Dream: The "Objectivity Question" and the American Historical Profession* (New York: Cambridge University Press, 1988).

13 Examples include Roderick Barman and Jean Barman, "The Prosopography of the Brazilian Empire," *Latin American Research Review* 13, no. 2 (1978): 78–97; T. F. Carney, "Prosopography: Payoffs and Pitfalls," *Phoenix* 27, no. 2 (1973): 156–179. James Scott's work popularized the idea of "hidden transcripts"; see *Domination and the Arts of Resistance: The Hidden Transcripts of Subordinate Groups* (New Haven: Yale University Press, 1990).

14 Lara Putnam, "To Study the Fragments/Whole: Microhistory and the Atlantic World," *Journal of Social History* 39, no. 3 (Spring 2006): 615–30.

15 Michel Foucault, "The Order of Discourse," inaugural lecture given at the Collège de France on 2 December 1970, in *Untying the Text: A Structural Reader*, ed. Robert Young (London: Routledge, 1981), 48–78.

16 Oscar Lewis, *Five Families: Mexican Case Studies in the Culture of Poverty* (New York: Basic Books, 1959), 1.

Perhaps the best known literary voice from Latin America, Gabriel García Márquez, relied on numbers to make a point in his Nobel Prize for Literature acceptance speech in 1982. His astounding quantitative list condensed unfathomable realities into numbers. Since the 1970s, he explained, "there have been five wars and seventeen military coups. . . . Twenty million Latin American children died before the age of one—more than have been born in Europe since 1970. Those missing because of repression number nearly one hundred and twenty thousand, which is as if no one could account for all the inhabitants of Uppsala." He continued, ". . . over one hundred thousand [men and women] have lost their lives in three small and stubborn countries of Central America: Nicaragua, El Salvador, and Guatemala. If this had happened in the United States, the corresponding figure would be that of one million six hundred thousand violent deaths in four years." How revealing that a fiction writer relied upon numerical scale to tell this tale.[17]

García Márquez's elegance with numbers is matched by a paradox pointed out by the economist Amartya Sen in his poignant analysis of the "100 Million Missing Women."[18] Sen uses the ratios of women to men in different countries to calculate the deficit of women who would be alive if these women had received similar care as men (thus the title).[19] Using, among other examples, the relative dearth of women in Japan as compared to sub-Saharan Africa, Sen's point is to push beyond simplistic explanations of culture or economic development to consider a suite of social conditions. Rich and poor, men and women, colonizer and colonized, the stories these numbers tell have a human side and a scale that deepens the context in a way individual narratives cannot.

Numbers also matter to contrasting cultural interpretations. Take, for instance, the popular scientist-turned-historian, Jared Diamond, who uses the encounter between the Spanish and the Incas as not only a thesis-proving anecdote—that guns, germs, and steel explain Western ascension—but also as an illustration for his book's cover.[20] Diamond asks

17 For this speech, I draw upon Greg Grandin's inclusion of a larger excerpt in the concluding chapter of his book, *The Last Colonial Massacre: Latin America in the Cold War* (Chicago: University of Chicago Press, 2004), 169.

18 Amartya Sen, "More Than 100 Million Women Are Missing," *The New York Review of Books* 37, no. 20 (20 December 1990).

19 According to Sen, the ratio in Europe and North America is 1.05 or 1.06 women to men. At birth, there are 105 or 106 male children to every 100 female but biology as a whole favors women, who, when given similar nutrition and general health care, tend to live noticeably longer.

20 Jared Diamond, *Guns, Germs, and Steel: The Fates of Human Societies* (New York: W. W. Norton, 1997). Historians, anthropologists, and geographers have written many critiques of Diamond; for a few illustrative examples see James M. Blaut, "Environmentalism and Eurocentrism," *Geographical Review* 89, no. 3 (1999) and Patricia Ann McAnany and Norman Yoffee, *Questioning Collapse: Human Resilience, Ecological Vulnerability, and the Aftermath of Empire* (Cambridge and New York: Cambridge University Press, 2010).

how Pizarro's 168 soldiers defeated Atahuallpa's 80,000 men. He concludes that disease, technology, and literacy made the difference. Another interpretation might consider the religious reverence for the Inca leader, which paralyzed the soldiers from responding. Culture, in this case, did trump numbers, but what parts of that culture tell the story most fully?

The challenge of scale, then, is to think about ratios as a way of seeing and understanding patterns. Environmental lenses—on germs, on reproductive health, on war—enhance that view. The cultural turn reminds us that numbers alone are not the whole story, but does not advise abandoning proportional considerations altogether. We must think about how culture can sometimes overcome seemingly obvious ratios, thus revealing the unpredictable side of humanity.

Organismal: A Scale beyond Us[21]

What does it mean to take plants, microbes, and nonhuman animals as serious factors in shaping—and being shaped by—human history? The vicuña might help us here. South America has few native ungulate species, but above the tree line in the vast Andean *puna* roams the vicuña, a wild cousin of the llama. Vicuña are the smallest of the camelid species but they have the finest, most exquisite wool in the world that for half a century has fetched prices three to five times the price of cashmere.[22] This characteristic nearly led to their extinction. In the 1960s, the Peruvian government began a conservation program that increased animal numbers from 6,000 to 25,000 in a decade (today they number more than 350,000). A vicuña cannot choose whether the mountains it inhabits reside in Peru, Bolivia, Chile, or Argentina, but the lucky animals in Peru were selected for survival. Environmental history's premise is to take seriously the influence of nonhuman nature on the human story, which means knowing and understanding species beyond our own. To consider other species as actors in history is not to claim their agency; it is to recognize that the human story would be incomplete without them.

21 Paul S. Sutter, "The World with Us: The State of American Environmental History," *Journal of American History* 100, no. 1 (2013): 94–119 and Bron Taylor, "'It's Not All about Us': Reflections on the State of American Environmental History," *Journal of American History* 100, no. 1 (2013), 140–44.

22 Gabriela Lichtenstein, "Vicuña Conservation and Poverty Alleviation? Andean Communities and International Fibre Markets," *International Journal of the Commons* 4, no. 1 (2010), 100-121; Wilfredo Pérez Ruiz, *La saga de la vicuña* (Lima: Diálogo, 1994), 49.

Figure 2: Vicuña grazing in Pampa Galeras Reserve, Ayacucho, Peru, 2009. Photo courtesy of the author.

There is a tension between the various levels at which we can (and cannot) gain knowledge about nonhuman organisms. On the one hand, there are scientific studies of humans' influence on other species and historical studies of the influence of other species on human lives (this influence is particularly strong for microbes, pathogens, and disease vectors). At the same time, there is much we cannot possibly know about other organisms' inner lives or orientations. The challenge for environmental history, then, is to mine the conjuncture between these fields of knowledge. Edmund Russell has recently argued for greater attention to evolutionary history, a field that "studies the ways populations of human beings and other species have shaped each other's traits over time and the significance of those changes for all those populations."[23] Russell points out that evolution is

23 Edmund Russell, *Evolutionary History: Uniting History and Biology to Understand Life on Earth* (Cambridge and New York: Cambridge University Press, 2011), 5.

ordinary and it happens all around, shaping our lives. What did the cascade of choices in the Andes that nearly extinguished the vicuña mean for this animal or for the people who today purchase $21,000 jackets made of its wool?[24] At minimum, we know the species are intertwined in complicated ways.

Organizational: Practical and Political Difficulties

Figure 3: Road descending Andes into Amazon basin, Manu National Park, 2011. Photo courtesy of the author.

Manu National Park, created in 1973 in Peru's western Amazon, is a park known for its biodiversity.[25] Among its quantitative attributes, the park boasts 10 percent of the world's species of birds, 15 percent of its butterflies, and 20 percent of its flora. The key feature of the park that captures this range is the inclusion of a portion of the Andes mountain range in combination with the lowland forest. By stretching up extreme gradients, the park catches a wide range of life forms. But the park also has amazing cultural diversity.

24 David Coggins, "Why Does a Vicuña Jacket Cost $21,000?," *Wall Street Journal,* 20 September 2013.
25 Manu's size, at 1,716,295 hectares, is equivalent to all of the protected areas in Costa Rica combined.

More than 2,300 known indigenous peoples live within the park, classified in three different categories by the Peruvian government to differentiate their relationship with broader society: native communities, indigenous people (*indígenas*) in initial contact, and native people in voluntary isolation. Small communities of mestizo peoples, many residing in the area since the land grab associated with the rubber boom of the 1890s, inhabit the park's fringes. The park also hosts communities of scientists (especially at Cocha Cashu Biological Station) that live in the forest for months on end and tourists that visit for several weeks. But knowledge is not the only thing extracted from the park, although it is the only legal withdrawal. Loggers, gold miners, hunters, and oil prospectors also seek to appropriate the treasures of the area and often do so clandestinely. The area maintains a national designation as a park, but it has also boasted the transnational moniker, UNESCO World Heritage Site, since 1987.

Which level of authority is the appropriate site to tell the story of Manu's history—native, communal, scientific, economic, national, transnational, global? Although political scales make sense for matters of convenience, their revelatory attributes are more in flux. Many debates between humanist disciplines and the biological or physical sciences hinge on the issue of authority. Who determines the value of a place like Manu—is it the Machiguenga elder who knows the ethnobotanical richness of his heritage or the Western scientist who has used her powers of observation to track the healthy jaguar populations and understand their predatory instincts? To account for these varied perspectives, the challenge is one of scale. It goes beyond size to questions of influence, authority, and ultimately, power. Here, the work of a historian wrapping these perspectives into a single story and bridging competing disciplinary lenses might provide enough context and inspire enough empathy to more fully account for the issues raised by a national park.

Conclusion: Towards Scalar Thinking

There is no single perfect scale; excellent history takes many forms.[26] Historians are lumpers and splitters—perhaps the original data managers. Part of what we do is recycle and repurpose ideas, and part of that involves organizing them to harmonize with

26 Consider the range between Anthony Grafton, *The Footnote: A Curious History* (Harvard University Press, 1999) and Christian, *Maps of Time*.

new insights.[27] The challenge of environmental history becomes selecting multi-scalar categories to draw upon.[28] Fully embracing the challenges of scale gives environmental historians the ability to shift from the microscope to the telescope, and, perhaps most revealingly, to the kaleidoscope. Engaging dilemmas of scale will allow historians to move beyond the habitual and soothing shades of gray or stimulating marginalia to begin asking truly critical questions and writing illuminating comparative work.

The tools to overcome these challenges have never before been sharper or more accessible. Geographical information systems, organizational software, data visualization graphics and more can not only transform how we tell stories; they can shape the very questions we ask. Lest we see the elusive siren of technology as an escape rather than a technique, we must remember that all people do not have equal say in deciding what resources are used in what ways, nor do we have perfect information about the environment to determine the potential ramifications of our actions. Only by understanding how certain people (or species) have been excluded and others overrepresented can we begin to make our narration of the present full of richer choices. There is no one crucial challenge of environmental history, any more than there is one correct response, but I hope more of our conclusions come to consider the scales in which we write.

27 For a thoughtful meditation on recycled ideas, see Jonathan Lethem, "The Ecstasy of Influence: A Plagiarism," *Harper's Magazine*, February 2007, 59–71.
28 Simon A. Levin, "The Problem of Pattern and Scale in Ecology," *Ecology* 73, no. 6 (1992): 1943–67.

Mei Xueqin and Jon Mathieu

Mountains beyond Mountains: Cross-Cultural Reflections on China

We left Munich's Central Station for a short trip to the Alps on the morning of 16 August 2013—"we" being Mei Xueqin, a Chinese historian specialized in the environmental history of the Industrial Revolution and industrialization generally; and Jon Mathieu, a Swiss historian with a focus on mountain regions. We were both RCC Fellows, and we were heading towards a small place in the Swiss Engadine for a summer school on the transnational history of mountains. Mei had never been to the Alps before. She was curious about what they looked like and whether they were very different from the Chinese mountains she was acquainted with. Jon had been coming to this part of the Alps from a tender age (his parents came from the Engadine), but never in the company of a Chinese historian. The day had dawned gloriously, the train ran smoothly, and thus, quite naturally, a conversation developed about the particularities of mountains East and West. How were they perceived in the past, and how did this perception change over time?

We were both in agreement with Donald Worster about the significance of culture. Recently he had stated that "the study of the human past, or what we call history, has fundamentally been about how cultures change over time and how those changes have made an economic, political, and social difference. We historians have never been able to *explain* those cultural changes very well, but we have managed to show how such changes in a people's values, perceptions, and attitudes underlie the distribution of power, the rise and fall of religions, the relationship between the sexes, and the technologies that power our civilizations, to name only a few of the greatest consequences."[1]

To be sure: it is not easy to assess a people's values, perceptions, and attitudes. Which indicators should historians choose in the case of mountains, which ideas and practices, and how can we trace them through historical sources? Perceptions of mountains have a particular weight, since they have often been seen as a symbol, or embodiment, of nature as a whole. When the French Revolution wanted to stage the "reconciliation with nature" that the *philosophes* had been talking of for so long, they designed large public theatrical displays involving "holy mountains" where white-clad women—the goddesses of

1 Donald Worster, "The Flow of Empire: Comparing Water Control in China and the United States," *RCC Perspectives* 2011, no. 1, 3.

reason—received the "laws of nature" from a "Supreme Being." This is just one conspicuous example of the cultural appropriation of mountains during the Enlightenment and Romanticism by the elites in Europe.

In the course of the conversation, as the train moved from Munich to the Alps, Jon remarked that the European appropriation of the Alps was indeed a great cultural change—interesting, and well studied. But, he added, Chinese mountain culture had impressed him very much with respect to its historical age, social power, variety, and systematic territorial layout. The Chinese example was far too little known in Western scholarship. He had recently touched upon it in a book about mountains in modern times. That comparative attempt, however, was hampered by the cultural and linguistic gap between researchers East and West, since it could draw only on studies published in European languages. Mei likewise emphasized the difficulties of crossing linguistic and cultural borders. She knows these difficulties in detail, and has spent many years confronting them as a translator of Western historical books into Chinese. We both agreed that if there is one major challenge in doing environmental history today, it is located in this kind of cross-cultural communication.

Thus we decided to enter into something of an experiment, born out of intellectual curiosity and the train journey we shared. Jon would write down some of his impressions of the history of Chinese mountain culture that he had learned about *from the outside*. Mei would then describe her experiences and reflections about the same subject *from the inside*. Let's see what happens!

Jon: Chinese Mountains from the Outside

"There is no such thing as *the* Asian perception of nature," I learned from a scholarly overview of ways of seeing nature in Asia.[2] As in the West, perceptions in Asia are also differentiated. Within one culture there are often many, partly controversial points of view, which—together with actual environmental transformations—change again and again. Nevertheless, according to this overview, there are certain general traits in many Asian societies that can be identified: In comparison to the West the distinction between

2 Citations for all passages quoted here are given in Jon Mathieu, *The Third Dimension: A Comparative History of Mountains in the Modern Era* (Cambridge: The White Horse Press, 2011), 129–32; I follow that section rather closely.

"nature" and "culture" was usually less categorical. "Nature" was therefore viewed more in context and had to be continually redetermined and redefined. This often happened by ritualistic means, and the ritualization in many Asian societies was tantamount to a sacralization of nature. When elaborate religious teachings were also added, the landscape was literally "empowered" and charged with religious or spiritual energy. In the Indo/Sino/Tibetan cultures this spiritual empowerment was widespread—albeit with diverse driving forces and characteristics.

The Chinese variant of this, in my view, had a decidedly political character. There are various clues pointing in that direction. Even the Emperor, for example, showed a keen and official interest in mountains. In studies at hand, I came across several prayers of the Emperors to the holy Eastern Mountain, Mount Taishan. When Wanli succeeded to the throne of the Empire as the 13th Emperor of the Ming Dynasty in 1572, he was barely 10 years old. Shortly thereafter, entirely in the style of earlier rulers, he addressed the following words to Mount Taishan:

> O God, You give birth to everything which must bloom, and You concentrate the supernatural energy in Yourself. You are the eternally lasting glory of the oriental lands. You assure the peace of the people and of all beings. Ten thousand generations have really found help from You. Now, through the rights of heredity, I have been invested with supreme power. With deference I perform the rites; oh God, would You accept the sacrifices and listen to the prayers; stand by my dynasty.

Several months before his death, Wanli's predecessor had ordered that the temple of the mystical Jade Emperor on Mount Taishan be renewed and rebuilt in such a manner that it would envelop the highest rocks of the Eastern Mountain. The mountain had long been dotted with shrines, temples, inns, small shops, and other buildings and monuments. Now the summit would receive a religious identity, too, indicated by the temple's inscription: "Summit of the Jade Emperor, Repaired by Imperial Order." The Jade Emperor was the sovereign ruler of the Taoist pantheon, the members of which were assumed by the faithful to reside in the remote Kunlun Mountains in the west of the empire. However, at Mount Taishan one could appeal to many other deities and persons who had become immortal. For example, in the vicinity of the aforementioned temple, Wanli's predecessor-but-one had begun with the construction of a temple to Confucius, which was then finished during Wanli's reign. Many stories circulated regarding what

the great philosophical master was supposed to have said at Mount Taishan, which had the effect of spreading his cult further.

At this famous place one could also pay homage to the Deity of Mount Taishan itself. Emperor Wanli did this only from a distance and never personally undertook the pilgrimage. However, three of his successors visited the Eastern Mountain in the seventeenth and eighteenth centuries. They left behind numerous inscriptions, including some which were related to the mountain deity himself, for example: "The Associate of Heaven Who Is the Guardian of the Empire" (1684) and "Tai Peak Bestows Happiness upon Us as a Reward" (1731). These attributes were in keeping with popular ideas that were widespread in China. In numerous cities and villages of the empire there were temples dedicated to Mount Taishan, in which written characters emphasized the mountain's godly qualities: "His holy virtues equal those of heaven," "His godly power rewards and punishes," and "to escape His deep sight is difficult."

Figure 1: Mount Taishan, Shandong Province, in 2007. At that time the mountain was likely visited by more than six million people per year. Photo by Jiang, via Wikimedia Commons.

Just as common, and well documented, was the popular pilgrimage to Mount Taishan in the early modern period, which continued after the declaration of the republic in 1912.

Until the communist revolution in 1949 one could count thousands of pilgrims daily during the main months. Later, as the People's Republic of China began to open up, Mount Taishan once again attracted many pilgrims and more and more tourists. In 1987 it was added to the list of UNESCO World Heritage Sites (right after the Great Wall). At roughly 1,500 meters it is not high, but as far as I can see, this mountain has the oldest and densest cultural tradition in the world!

Figure 2: "Image of the True Form of the Five Peaks." The five holy mountains of the Confucian-Taoist tradition represented on a print from a stone column engraved around 1614. Edouard Chavannes, *Le T'ai Chan. Essai de monographie d'un culte chinois* (Paris, 1910).

In my view, Chinese mountain culture is also unique in a territorial sense. Mount Taishan did not stand alone; it was part of a vast system of holy mountains. The Five Peaks of the Confucian-Taoist tradition include, besides the Eastern Mountain (the most important of them), a holy mountain in the north, in the west, in the south, and in the middle of the Chinese Empire. Their heights are conspicuously modest (roughly 1,290 to 2,020 meters), and the distance between them quite considerable (over 1,400 kilometers from the Northern to the Southern Mountain). The Five Peaks were represented with particular signs and characterized by a series of quasi-administrative criteria. From experts in toponymy, I learned that the mountains had spoken names: "Tai" (Taishan, the Eastern Mountain) meant "prosperity, peace, and tranquility;" "Heng" (Hengshan, the Northern Mountain) meant "endurance and tenaciousness;" "Hua" (Huashan, the Western Mountain) meant "flower;" and so on. According to ancient Chinese literature the Five Peaks were early checkpoints for the inspections of the empire by the Emperor and his delegates. In general it was believed that the mountains ensured the stability of the Earth with their weight. In materialized form, the "Image of the True Form of the Five Peaks" represented a talisman of great protective power.

It is general knowledge that in the first centuries CE, Indian Buddhism, which has an interest in nature much like that of Taoism, reached China. In the style of the Five Peaks, Chinese Buddhism later brought forward its own system with the four holy Buddhist mountains, also dispersed far across the land. At the most important of them, there were hundreds of small and large monasteries and temples in the early modern period. The introduction of Buddhism and the particular political situation were among the reasons for a new perception of the landscape and mountains that gained currency in Chinese society starting in the fourth century. Paul Demiéville, a well-known scholar from an earlier generation, has described this development as a veritable romantic revolution, in which fleeing from civilization became a leitmotif.[3] The mountainous landscape was a theme in paintings and in literature during this period and continued to exert influence and spawn new artistic developments for a very long time. Even Chairman Mao Zedong still stood in the shadow of this classical tradition and wrote poems about the mountains.

So, in the end, it seems to me that the Chinese mountain experience is not only particularly intense and expressive, but is characterized by two structurally opposing phenomena: on the one side a close connection with the governmental-political structure and the systematic territorial layout, and on the other side an early criticism of civilization and romanticization of nature. I have the impression that "romanticism" was a rather different thing in China than in Europe. If we put the two phenomena under the same heading, however, the Chinese version came about more than a thousand years earlier.

Mei: Chinese Mountains from the Inside

Jon's thinking and writing about the Chinese perception of their mountains is very interesting and important because it highlights some key aspects, especially regarding political and religious themes. However, his ideas appear a bit simplified, and reflect to some extent the understanding of foreign friends of Chinese mountain culture. Simplified or not, this understanding has a role to play in stimulating us within China to think about our own traditions. It is really quite important for us to "do" China's environmental history through these kinds of perspectives, from both the outside and the inside—this might help us to escape some of the shortcomings of knowing only one side of the story. China

3 Paul Demiéville, "La montagne dans l'art chinois," in *Choix d'études sinologiques (1921–1970)* (Leiden: E.J. Brill, 1973), 364–89.

"complements, and contrasts with, the environmental histories of other major countries and peoples. It often provides a critical analytical challenge when testing any general theory mostly formulated in some other context," as Mark Elvin has written.[4] This point of view is certainly reasonable when we discuss perceptions of nature focusing on mountains and compare China with other countries and peoples.

One should always keep in mind that Chinese mountain culture is very complex; we have to go deeper into China's history and culture before we draw any simple conclusions. For example, when we talk about the Five Peaks or The Five Great Mountains (五嶽/五岳/Wǔyuè), we certainly know that they refer to five of the most renowned mountains in Chinese history, and they were the subjects of imperial pilgrimage by Emperors throughout ages. But this kind of knowledge about the Five Peaks in Chinese culture is not very profound. To understand why there are precisely five of these mountains, not six or any other number, we should also know the origin of the Five Peaks and the cultural meaning of the number five. Then we must at least come to grips with the Chinese mythological system and traditional scientific knowledge.

According to Chinese mythology, the Five Peaks originated from the body of Pangu (盤古/盘古/Pángǔ), the first being and the creator of the world Mount Tài (東嶽/东岳/Dōngyuè), owing to its prominent location, is believed to have been formed out of Pangu's head. Mount Heng in Hunan province (南嶽/南岳/Nanyuè) is believed to be a remainder of Pangu's right arm; Mount Heng (恒山) in Shanxi province (北嶽/北岳/Běiyuè), his left arm; Mount Song (中嶽/中岳/Zhōngyuè), his belly; and Mount Hua (西嶽/西岳/Xīyuè), his feet. Because of its eastern location, Mount Tài is associated with the rising sun, signifying birth and renewal. Due to this interpretation, it is often regarded as the most sacred of the Five Peaks. Every year there are lots of people who visit Mount Tài and pray for their families and friends while they enjoy the sunrise and the landscape there. I climbed Mount Tài three times with my classmates and my students, and was deeply impressed by both its natural beauty and its long cultural history.

As to the meaning of the number five, it is a recurring theme in Chinese traditional science and spirituality, as in the five elements (wood, fire, earth, metal, water), the five cardinal directions (East, South, West, North, and Center), and the System of Five

4 Mark Elvin, "Introductory Remarks," in *The Retreat of the Elephants: an Environmental History of China* (New Haven and London: Yale University Press, 2004), xxi.

Phases (五行/Wǔ Xíng). The Five Peaks were chosen in accordance with the five cardinal directions of Chinese geomancy (風水/风水/Fēng Shuǐ). Certainly, the exact locations of some Yuè (mountains of the Five Peaks) which pointed to a particular direction underwent change. For example, Nányuè (Mount Heng) once referred to a different peak. It is said that before the Sui dynasty, Nányuè referred to Tianzhushan in Anhui province, and that this was proclaimed by Emperor Wudi of the Western Han Dynasty when he visited it in 106 BC. Under the Sui dynasty, Emperor Wendi changed Nányuè to refer to Héng Shān (衡山) for the purpose of ruling. Here, the meaning of *héng* (衡) is "balance," quite different from the prior name Héng Shān (恒山), in which *héng* (恒) means "eternal." This change also reflects the expansion of the country in that period.

Based on the aspects related above, we would say that the mountain in China's history had two kinds of existence. On the one hand it was a tangible mountain, on the other an invisible mountain. The former is the "natural" mountain, and has its own location, size, topography, landscape, wildlife, and so on. There are many sources that record detailed information on these points. Among them, the *Mountains and Rivers Gazetteer* or *Local Landscape Records* (山川志/Shanchuan Zhi) are very important, and almost every local chronicle includes landscape records. Moreover, China's famous mountains have their own history. *China's Famous Mountains Gazetteer* (中国名山志/*Zhongguo Mingshan Zhi*), which was published by the China National Microfilming Center for Library Resources (http://swzx.nlc.gov.cn/zxjj.htm) in 2005, is a series of 16 volumes of mountain history. It has great value because it gives a comprehensive overview of research on the history of China's famous mountains, published in a collection for the first time in contemporary mainland China.

The natural mountains have always been associated with peoples' lives in many ways. First of all they provide resources and livelihoods. For my father's family, mountains were the source of firewood as well as of many local foods such as chestnuts and other nuts. My family used to live in a mountain valley of Tàihu county in Anhui province, and moved to a plain because of the building of the Huating reservoir in the 1950s. After that, every year in winter, my parents would go to the old mountain area to harvest firewood for the next year. Villagers living on the plains can get some firewood from mountain areas for free, but they pay with their effort and time. I always remember that when I was 13 or 14 years old, I followed my mother and other villagers to walk 15 or more kilometers into a mountain valley to collect pine needles. We got up quite

early and brought some food and water along. Then we worked a whole day in the mountain valley and returned back home at dusk, carrying a load of pine needles. Of course, this work was very hard and beyond my capacity at that age, but it was a good test of my physical strength and psychological endurance. Strength and endurance are the kinds of qualities that Chinese attribute to their mountains.

Figure 3: Huating Lake and Mountain of Dragon, Anhui Province, the birth place of Mei's father. The lake is actually a reservoir. It was built in the 1950s and caused Mei's family to migrate from the middle of the mountain to the plains. Photo courtesy of Lu Xinlin.

However, mountains also posed various kinds of threats to people in the past. Wild animals from the mountains were one of these threats. My father once told me that at the end of the 1950s and in the early 1960s there were two accidents that happened in my clan. One of my distant uncles was injured by a wolf while herding cattle on a mountain. His hip was bitten so seriously that his mother had to have the skin of her left leg removed so that the doctor could sew up her son's wound in a county hospital. Another relative was taken by a wolf when he was three years old, after following his mother and brother to the kitchen garden one afternoon. These kinds of accidents often happened, and we still saw wolves that had come down from nearby hills passing through field ridges up to the 1960s and 1970s. So mountains with their wild animals were a terrible force in my heart as well as in many Chinese minds.

Figure 4: The first part of "Dwelling in the Fuchun Mountains" by Huang Guangwang (1269–1354). Ink on paper hand scroll, currently kept in the Zhejiang Provincial Museum in Hangzhou. Photo from Wikimedia Commons.

Strength, endurance, and terror are amongst the qualities attributed to mountains by us Chinese, and these qualities are also a part of China's invisible mountain. This is certainly a mountain in perception, and has a variety of meanings and imagery. The invisible mountain includes Jon's analyses of the two structurally opposing phenomena. The imagery of mountains in ancient Chinese poetry has been an interesting subject of research. It had a lot of metaphorical applications—holiness, eternity, barriers, morals, refuge, and so on. Ancient poetry including mountain imagery is an important part of Chinese mountain culture, and has a special value for us due to its exploration of Chinese perceptions of nature. Landscape drawings are also very important and valuable sources for this investigation because they have the characteristics both of tangible and invisible mountains. I give here an example painted by the famous Yuan Dynasty painter Huang Guangwang in the mid-fourteenth century.

Conclusions

Jon: This was a great insider's lesson about Chinese mountains! Mei's input confirms that cooperation in the larger scholarly community is extremely important for research. Cross-cultural communication continues to be a challenge, but it is both possible, and fun. I hope that not too much local specificity gets lost with the simplifications that

might be necessary in comparative studies. Geographers tell us that between one-fifth and one-fourth of the surface of the earth consists of mountain regions. As a result, there is great potential for the emergence of and changes in "people's values, perceptions, and attitudes," to take up these words again. My impression of the specific power of mountain perceptions in Chinese history and contemporary society has been reinforced by Mei's account.

Mei: It is quite a big task for us to really know the mountains and their unique cultural implications when we do environmental history research. I have visited many mountains within and beyond China, and I understand that there are many more that I have never experienced: as stated in a Chinese expression, "there are mountains beyond mountains." The direct meaning of this phrase is that there is a higher peak in front of (or behind) any peak, and there is more beautiful scenery beyond what you see. Metaphorically, it means that there are always people who are even cleverer than you. So this phrase might encourage people to persevere and to do better in order to realize their aims. I agree with Jon that when we discuss and research any subject in environmental history, we need to strengthen communication and cooperation in the larger scholarly community. We might then cross both the physical and cultural barriers and understand nature—and ourselves—better.

Richard Tucker

Pursuing Environmental History on India's Himalayas: Challenges and Rewards

Introduction

The Himalayas exemplify all the complexity and distinctiveness of mountain systems around the world. Their geology is so intricate that it is still not understood in detail. Their ecosystems vary by elevation zone, sunward or shadeward slopes, soil patterns, and seasonal cycles—the contrasts are dramatic where monsoon Asia collides with the northern Asian land and climate mass. In this setting species diversity is extreme and still understudied.

So dynamic and variable is this terrain that human history has also varied from one mountain valley to another and from upland areas to adjacent lowlands. To study history in these mountains is inevitably to study environmental history, the interactions between human communities and their natural settings. For over 2,000 years human settlements have dotted the region in great ethnic and linguistic complexity.

Localism and Nationalism

For two millennia minority groups have drifted northward from the Indus and Ganges lowlands into the river valleys of the western and central Himalayas. Like mountain regions elsewhere, these mountain valleys have been peripheries of population, power, and wealth in the lowlands. They have been defensive against incursions from lowland capitals, yet dependent on the lowlands for anything more than minimal subsistence. Stratification of wealth, power, status, and landholding has tended to be less extreme than in the wider regions of the subcontinent. But over the centuries, local landholding elites in several locations have held both status and responsibility as guardians of their people against pressures from the south.

The Nepal Himalayas were never absorbed into the imperial regimes of the Gangetic heartland and remained separate even in British imperial times. But to the northeast,

up the Brahmaputra valley, and much more in the northwestern region toward Kashmir, the impact of Western colonial systems was widespread from the early nineteenth century onward. For this region the overriding subject for me became the differences of degree and kind that the European impact had. It was to be my major fascination in the second stage of my career.

Scope and Themes of My Work

I was a decade into my historical research before I turned to the specific (and comparative) question of the environmental history of mountain societies. I had previously been interested in the response of social elites in urban India to British imperial rule. But at one point in the late 1970s, I became aware that their contested political territory included what we now would call environmental politics—especially control, exploitation, and management of forests. This resonated with the newly prominent international alarm over the rapid decline of tropical forests. So I began to pursue the story of controversies over forest resources in the setting of the British Raj—that is, British colonial rule in India—beginning in the 1850s. Could we understand the rates and processes of forest reduction in the Indian subcontinent better by placing them in the context of the nationalist resistance to British rule? Did Indians and the British have competing or complementary interests in the forests? Did India's intricate socio-economic hierarchy create comprehensible contests between different sub-groups that helped explain the role of forest protests in the Freedom Movement? Moreover, did they help explain the contradictory post-Independence legacy of the Raj after 1947?

I selected the area of the western Himalayas that fell under British rule and administration, first after the 1815 conquest of Kumaon and Garhwal in the upper Gangetic region and then after the 1847 conquest of Punjab and its northern mountain hinterland.[1] This was the first large segment of the Himalayas that experienced intensive pressures of modernization, beginning with massive cutting of the hardwood forests for building the civil manifestations of military control and economic development: army cantonments (permanent military stations) and the region-wide railway grid.

1 A survey of the environmental history of this region can be found in Chetan Singh, *Natural Promises: Ecology and Peasant Life in the Western Himalaya, 1800-1950* (Delhi: Oxford University Press, 1998).

For the century of British rule until 1947, the most prominent stories of colonial ecological change centered on the pine forests of the Himalayan foothills (construction timber and industrial turpentine), the middle-elevation zone of Himalayan cedar (railway sleepers and other strong construction uses), and ultimately the higher-elevation spruce and fir stands, though these were not widely exploited until the 1950s. In the Reserved Forests there were three-way tensions in this work. The Forest Department worked with (and frequently against) private contractors, most of them from the lowlands and ethnically different from the hill villagers. Hill men were hired as forest laborers, often distrusting both officials and contractors.[2]

The two world wars, with their impacts on imperial administration and forest products extraction, comprised two disruptive and confusing periods in this century of colonial rule. Little had been written about the impacts of those inter-imperial wars on peripheral mountain regions around the world, but India's forestry records indicated that the imperial administration was able to accelerate timber fellings intensively during both wars, providing critical resources for military campaigns in the Middle East and elsewhere. In 1914 an elaborate system of railways was in place in lowland India for transporting timber to coastal ports, but transport infrastructure in the hill regions was still elementary, and wheeled vehicles were rare. But by 1939 the technological capacity of the Raj was far greater: trucks and jeeps moved along new forest roads, enabling timber extraction on a far larger scale. This continued in the turbulent conditions that followed in the late 1940s, marked by the creation of Pakistan and the transfer of Indian forest management to Indian officials. In 1944–45 senior British forest officers reviewed the condition of these forests, claiming that in the long run their productivity had not been significantly damaged by wartime necessities. But was that assessment self-serving, as they prepared to turn over management to their Indian protégés? That is still a visible element of the debate over the colonial legacy. This is not only political or cultural history; in essence it is environmental history.[3]

2 This and my other publications on the region are collected in Richard Tucker, *A Forest History of India* (New Delhi: Sage India, 2011).

3 Richard Tucker, "The World Wars and the Globalization of Timber Cutting," in *Natural Enemy, Natural Ally: Toward an Environmental History of War*, ed. Richard Tucker and Edmund Russell (Corvallis: Oregon State University Press, 2004), 110–41.

Challenges for Research: Working Conditions and Politics

Figure 1: India's Forest Research Institute, Dehra Dun. Photo courtesy of the author.

The changeable political history of the Himalayan region has had the result of dispersing historical records in many locations. This presents researchers with many kinds of difficult conditions. Administrative archives in the region are mostly underfunded, understaffed, and only partially organized. In India I often frequented the Indian Forest Service library in Dehra Dun, as well as several Forest Department district offices. For the evolving political context, briefer visits to the National Archives and Nehru Memorial Library in New Delhi were in order. Access to Princely States' records, including important portions of the western Himalayas, is much less orderly; I had to leave that work to Indian colleagues who were much better positioned to pursue the unpredictable process of finding whether any former royal archive had useful materials or not. For broader Himalayas-wide perspectives, the research facilities at ICIMOD (the International Centre for Integrated Mountain Development) in Kathmandu are highly valuable.[4]

In Britain the great colonial archives are generally well organized and staffed (partly because of the wealth that the imperial era brought to Britain), but even there the researcher finds many surprises, especially for areas that were geographically and politically peripheral to administrative centers. For the environmental history of the Indian Himalayas, the two great treasure troves are the India Office Library in London, absorbed now into the new British Library, and the remarkable Commonwealth Forestry Center in Oxford.

4 For a list of its many publications, see its website, http://www.icimod.org.

Reliable study of environmental history in mountain areas necessitates spending time on the ground to validate or evaluate historical archives on the scene. This contributes to the length of time required to complete any historical project, but it is also one of the great pleasures of the work. Forest Department officials in the districts were (with only an occasional exception) generous hosts on working sites; I had the benefit of long interviews with foresters, wildlife specialists, and NGO activists, and the great pleasure of trekking with shepherds and their dogs and livestock in the high country. Everyone offers a cup of chai as an expression of hospitality. I came to count my working days as 4-cup days, even 10-cup days, when my advisors and informants were available all at once. The 2-cup days were when my timing was wrong or unlucky.

Every aspect of this work is seasonal, for the demanding climate of the Himalayas, even in the foothills, presents difficulties in the cold winter and saturating monsoon seasons. Some libraries have to close for the cold months; others are almost inaccessible during the heavy summer rains. By early August frequent landslides block mountain roads, and even when the rains subside and roads are reopened, the cost of this research is far more than financial: all-night bus rides on incessantly winding roads are the penalty for the researcher's enthusiasm.

Research on the Indian Himalayas inevitably also takes a scholar into politically sensitive border regions, though this difficulty has gradually subsided in recent years. In the earlier years, from around 1980, historians who did not confine themselves to the archives but walked the hills, talked with resource managers, lived near displaced Tibetans, and trekked with shepherds were under surveillance if not suspicion by India's Foreigners Police. This was understandable in regions near the dangerous borders with China and Pakistan. So I had to be careful not to engage in any contemporary political controversy. In the northeastern Himalayas, where internal tribal insurgencies have plagued central and state governments for decades, there has been palpable danger to outside investigators. Government permissions are required for access to those border areas, and those permissions have generally been close to impossible to obtain for foreign investigators. The tendency of any government toward bureaucratic red tape and obscurantist attitudes comes into play, exacerbating legitimate official concerns.

During my research in India, ideological stresses among researchers presented another challenge. Many post-Independence writers in India placed the "blame" largely on

the British Raj for any social conflict or environmental stress that faced India in more recent times. These nationalist writers wrote history as moral tracts, as many of their British predecessors had done. Understandably, Western scholars sometimes had to demonstrate their credentials to Indian scholars as well as to bureaucrats. But out of this neo-colonial situation arose a rigorous debate over each writer's perspective and underlying attitude and the implications of each scholar's work for understanding the day's controversies. Indians had the major advantage of deeper cultural and linguistic understanding, while foreign scholars had the possible advantage of cultural distance. Even among Indians, urban elite writers faced the challenge of demonstrating that they comprehended the circumstances of non-literate people, lower castes, ethnic minorities, and rural women, as well as the urgencies of back-country poverty.

The public setting was sometimes less nuanced. After one lecture I gave on the complexities and counter-currents of colonial forestry management, a local journalist wrote an article stating that the American scholar had blamed the British for all of the region's environmental troubles. He entirely missed the question of whether our research is about *blame* at all.

All these factors have presented a variety of challenges to the writing of mountain environmental history. The broadest challenge is to sort out complexity: the great diversity of ecological, cultural, and linguistic settings, as well as of environmental change. And each essay has to struggle with the choice of contexts—matters of geographical and social scale, and perhaps of comparability with other studies.[5]

Beneath this consideration is the pervasive question of an author's fundamental criteria for the narrative. Is the account about management or degradation of natural resources? What is the difference between utilization and degradation? Are the author's criteria explicit or at least clearly implied? Do author and readers agree on the evaluative criteria?

Finally, there is the literary dimension: the challenge to write accessibly, even vividly, about the processes of resource extraction. My own prose had to struggle with the infection of forestry records' rhetorically dull conventional categories. Travelers and polemi-

5 Comparative perspectives on the environmental history of mountain regions around the world are discussed in many issues of the outstanding journal *Mountain Research and Development.*

cists have not been encumbered by administrative formalities and standardization, but each historian has to find a middle path for his or her own stylistic strategies in telling these remarkable stories. For they are not tales of routine, repeated procedures of subsistence and administration, but dramas (quiet or otherwise) of continuity and change in one of the world's most dramatic settings.

Broader Perspectives

Figure 2: Hardwood plantation, government forest. Photo courtesy of the author.

It seemed straightforward at first, studying the history of deforestation in one of the world's greatest and most fragile mountain regions. But the work led inexorably on to more complex issues. Forests are more than trees, mountain societies have always relied upon more than wood products for their development, and mountain ecosystems are impacted in vastly intricate ways. Under British rule traditional access to forests was redefined according to colonial forest law (imported models based on early modern German laws), which required written permits that villagers could obtain only from local forest officials. This meant the bureaucratization of village life, with its attendant delays, frustrations, and opportunities for corruption. In the rivalries between

Figure 3: Cedar forest: timber harvest. Photo courtesy of the author.

Figure 4: Ground fire in pine forest. Photo courtesy of the author.

local officials (both British and their Indian subordinates) and rural people, patterns of resisting and evading authority evolved, becoming a major dimension of the colonial legacy of resource management for post-Independence times.[6]

Anthropological studies provide essential contributions to our understanding of mountain history.[7] The backdrop to contestation over natural resources was hill village society and its patterns of subsistence and market exchange. This includes many non-timber forest products such as wild foods, medicinal herbs, and bamboos. The colonial regime had revealingly labeled them Minor Forest Products, ignoring their vital role in the household economy. Gender issues were embedded here, for the traditional gendered division of labor meant that women were the primary collectors of fuelwood and fodder on the mountain slopes. But village women's roles were ignored not only by colonial administrators but also by literate village men. Until at least the 1970s only the occasional eccentric anthropologist paid any attention to these complexities, which were tantalizingly indicative of environmental change.

Just as forests are more than trees, villages are more than people. Livestock are a crucial component of hill farming life anywhere. Another vital intersection between colonial foresters and village communities was transhumant grazing and its region-wide markets. Farm families in the lower hills maintained cattle locally, and in some areas (this

6 For another scholar's perspective, see Ramachandra Guha, *The Unquiet Woods: Ecological Change and Peasant Resistance in the Himalayas* (Berkeley: University of California Press, 1989).

7 For a wide range of studies across the entire Himalayan region, see *Himalaya: The Journal of the Association for Nepal and Himalayan Studies,* over three decades. A leading study of my research area is J. Mark Baker, *The Kuhls of Kangra: Community Managed Irrigation in the Western Himalaya* (Seattle: University of Washington Press, 2005).

varied widely from one sub-region to another) their men were also shepherds, taking large flocks of sheep and goats to alpine summer pastures as much as two high ranges to the north. The animals produced wool and meat, including enough wool to sell as a cash crop in lowland markets. The shepherds knew alpine pasture ecology better than anyone else, but their increasing numbers (though the trend in numbers was also contested) put pressure on young trees in the understory of forests. The British attempted to regulate the migratory flocks, recognizing their centuries-old significance and attempting to manage both the forests and social conflicts, but the relationship was never harmonious. One essential dimension of this transhumance rhythm was the shifting relationship between upland shepherds and their lowland wool buyers, one of the most important economic links between the two regions.[8]

Figure 5: Migratory sheep. Photo courtesy of the author.

These frictions between regime and people have led to various accommodations, well worth describing in themselves, not the least of which have been various strategies of community forestry. Official systems of cooperation between foresters and villagers took internationally recognized form in Nepal in the 1970s and were adopted with variations in India, state by state, beginning in the 1980s. Here too, historians have had an important role to play by studying a variety of antecedents to social forestry in British India from the end of World War I onward. My foray into description of late colonial social forestry in the Kumaon hills was an example of writing about the past from the explicit perspective of contemporary debates.

One more dimension of environmental history in the mountain region remained: the changing picture of wildlife. By the 1980s charismatic species such as the snow leopard and endangered game birds were hitting the headlines. It was important to study the

8 The finest study of this transhumant economic and social system is Vasant Saberwal, *Pastoral Politics: Shepherds, Bureaucrats and Conservation in the Western Himalaya* (New Delhi: Oxford University Press, 1999).

history of hunting (both local and imperial), species depletion of endangered flora as well as fauna, and the establishment of Protected Areas. In India, as in many countries, these locations have been marked by intensely differing priorities between local users of wild species and conservationists from urban and international bases.[9] Colonial Reserved Forest management included controls on hunting and an explicit nod to wildlife management. Many colonial officials and their European guests were avid hunters (and fishers on the mountain rivers), as were their elite Indian hosts. Many were also wildlife biologists, though formal credentials had to wait until after Independence, when India's magnificent system of National Parks emerged from a combination of long-standing aristocratic hunting reserves and colonial Reserved Forests. Walks with binoculars on high mountainsides and evening conversations with both village and elite hunters whetted my appetite for adding this dimension, which completed the spectrum of environmental change in the region.

Contemporary Applications?

This work has to deal (explicitly or implicitly) with the question of its significance for today's public controversies. In the 1980s, when systematic historical study of the interaction of mountain communities, government officials, and their ecological settings was in its infancy, more than one important environmental planner urged me to accelerate my writing because it would be highly valuable in informing the public debate over forest law and administration. Though I was gratified that my work might be valuable beyond an audience of university students, I was not a policy analyst or defender of any faction; indeed, I was only a guest in that country. Perhaps adhering to the standards of scholarly rigor is an adequate way of resolving my responsibility to my host country.

But there is one more aspect to that responsibility: the familiar challenge of the work's accessibility for Indian researchers and the general public. I published my work in scholarly journals on three continents over two decades. No one could know where to find it all and decide for themselves what its usefulness might be. I am grateful to friends in New Delhi and to Sage India Publisher for gathering those essays under one cover, so that they can be accessed easily by interested readers.[10]

9 For all-India context see Mahesh Rangarajan, *India's Wildlife History* (Delhi: Permanent Black, 2001).
10 Tucker, *A Forest History of India.*

Figure 6: Great Himalayan National Park. Photo courtesy of the author.

Through the years, the pleasures and rewards of working in the mountains have grown out of the difficulties and uncertainties. The exhausting bus rides, the occasionally futile searches for archival materials, the monsoon rockslides and unmet schedules: all have been counter-balanced by long walks, congenial meetings, sudden insights, and supportive colleagues. When long hours at the computer are rewarded by prose that flows easily and confidently, the sense of reward is all that anyone could require.

Christopher Conte

Africa's Mountains: Collecting and Interpreting the Past

Introduction

Highland landscapes are central to Africa's agrarian history. People have successfully managed them for agriculture and pastoralism for thousands of years. In eastern Africa, the subject of this essay, highlands offer a very attractive place to live; they are well watered, cooler than the surrounding savannas, and historically malaria free. Not surprisingly, then, the high country tends to be more densely populated than the iconic East African plains that lie below. This essay addresses the challenges of collecting and interpreting data for the environmental history of East Africa's highlands, here defined as an ecological category that includes steep-sided mountains as well as the Great Rift Valley's more gently sloping escarpments with their hills and plateaus situated well above 2,000 m.

Over the past two centuries, many highland regions across eastern Africa have witnessed pulses of violence stemming from conflicts over land, water, and forest. Of course, crisis and upheaval always stand out in the historical record, but highland history is also filled with less visible, but no less important, examples of landscape restoration and the creation of ecological health and productivity. As a whole, mountains in eastern Africa tend to be intensively managed environments susceptible to dramatic ecological transformations.

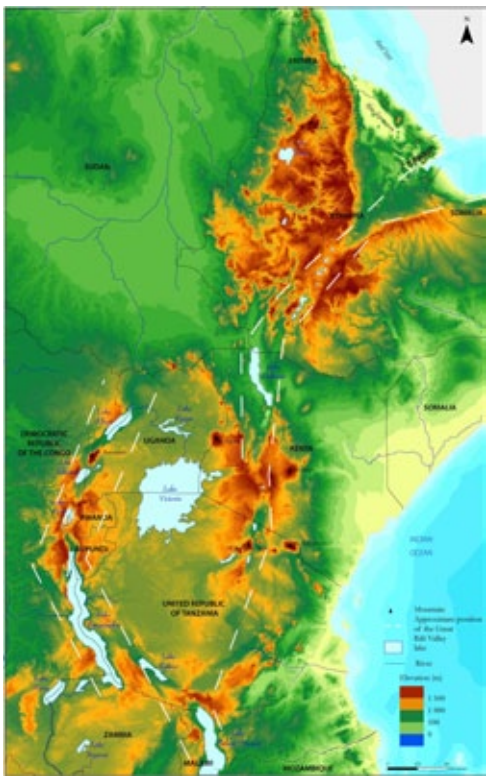

Figure 1: Map of the Great Rift Valley. Source: "Africa: Atlas of Our Changing Environment" (Nairobi, Kenya: United Nations Environmental Programme, 2008).

The Context

My first introduction to African highlands came at Narok, Kenya, where I taught high school as a Peace Corps Volunteer from 1981 to 1983. Narok High School (2,200 m above sea level) sits on a rolling hillside two miles north of Narok town (1,900 m). Narok, in the Maasai language, means black, and refers to the color of the river that runs through town. The river is blackish red because of cedar resins that leach into the river from riparian forests at the headwaters. From Narok, the dirt and gravel road leading north toward my school climbed from a dry, windy, and dusty flood plain in town up to the well-watered hills of the Mau Escarpment, a massive wall of long ridges that hover above the Great Rift Valley in western Kenya. Sitting on a pile of gravel beside my house in town and looking in the other direction, to the south, I could see the Loita Hills. The lush pastures of these rolling hills, many of them extinct volcanoes, were grazed by Maasai cattle in the dry season. The Mau uplands to the north had also been a dry season grazing area.[1] In addition to pastoralists, I heard about people called Okiek (often derogatorily, Dorobo), a foraging group that used the upper Narok River valley and the Mau forests in the early 1980s.[2] After independence in 1963, the Kenyan government began to open a large portion of this rainy and cold hill country to exploitation for lucrative commodities like timber and wheat, which meant the eventual exclusion of pastoralism. Since the 1990s, the Mau has become known as a magnet for the large-scale immigration of landless people from neighboring highland regions in central and western Kenya. The immigrants, mostly small-scale farmers, have settled in for the long haul. In only a few decades, the Mau landscape had been changed from the forest and pasture used by Okiek and Maasai into fields of wheat, gardens, tree groves, and residence compounds, all managed by recent immigrants.

As a doctoral student in 1990, I had planned to return to Kenya to study the social and ecological history of the Mau Escarpment, but the political tension in Kenya convinced me to apply for funding in neighboring Tanzania. The large influx of people into the Mau region has not played out without conflict. During the presidential elections of 2007, the tension exploded into deadly ethnic violence that claimed the lives of several thousand people in Kenya's Rift Valley Province, which includes the Mau. Of course, this was not

1 For Maasai environmental history, see the works of Richard Waller, for example: "Ecology, Migration and Expansion in East Africa," *African Affairs* 84 (1985): 347–70; "Tsetse Fly in Western Narok, Kenya," *Journal of African History* 31 (1990): 81–101.

2 Any hike down to and along the Narok River would reveal their ladders wedged into the rocks below their beehives.

the first such episode in the history of Kenya's highlands. The Mau Mau rebellion of the early 1950s, one could argue, constituted a similar sectarian and bloody conflict over the most productive agricultural lands in Kenya.

Land conflicts are not exclusive to Kenya. One of my MA students faces similar challenges on Mozambique's Gorongosa Mountain, which occupies the southernmost extension of Africa's Great Rift Valley. At Gorongosa, upland communities are exceedingly unhappy about the central government's extension of Gorongosa National Park onto areas that they farm. According to the terms of the mountain's annexation as park property, those living above the 700-meter elevation gradient must abandon their homes for an uncertain resettlement in another area. The government has taken the position that the mountain watershed, which supplies the park wetlands, is under threat from small-scale agriculture and must be strictly protected within the park. In a series of protests, mountain dwellers have taken to setting forest fires and destroying the tree nurseries set up by the national park for restoration efforts. Trees have become a symbol of oppression. Complicating matters further, in a protest against their exclusion from political power, the former Mozambican rebel group RENAMO has reformed itself on the western side of Gorongosa Mountain.[3] Government troops have responded by setting up a series of checkpoints along the area's main roads. The atmosphere remains tense and has swirled into deadly violence several times over the past few months.

Kenya and Mozambique are but two examples of challenging political and economic contexts that face researchers. Rwanda, Burundi, and the eastern Democratic Republic of the Congo contain heavily populated highland areas where historical research is both exceedingly problematic and a potential tool for explaining and defusing the tension. In what follows, I outline my own research experience in the Usambara Mountains of northeastern Tanzania. The Usambaras have seen many battles over resources, but although low-level violence has occurred, it has not reached the levels apparent in Kenya or in the lakes region of the western Great Rift Valley. Nonetheless, even in a relatively peaceful place like the Usambaras, many people have only a very tenuous claim to the land on which they make a living.[4]

3 The civil war in Mozambique lasted from the late 1970s until 1992. The peace negotiations legalized RENAMO (short for *Resistência Nacional Moçambicana*) as a political party.

4 For a discussion of land tenure history see Christopher Conte, *Highland Sanctuary: Environmental History in Tanzania's Usambara Mountains* (Athens, OH: Ohio University Press, 2004), 115. Land use is tied more to rights of access than to ownership with title deeds. Most land owners have a number of very small and dispersed garden plots. For those who hold no land rights, space may be borrowed or rented. Many of these landless people are women, and they are vulnerable to eviction and drought.

Conservation Biology, the Human Sciences, and Natural History: Intellectual Discourse and Landscape Health

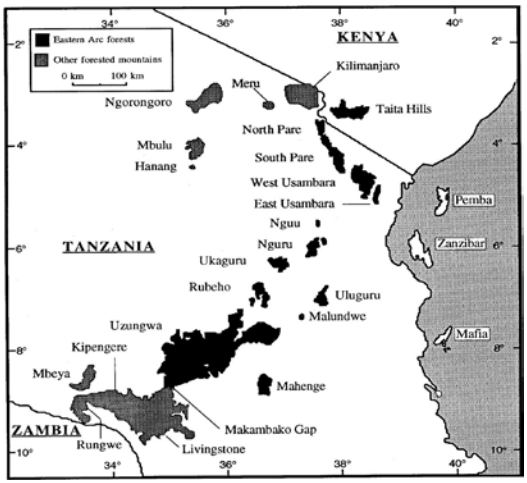

Figure 2: Detail map of Eastern Arc Mountains. Source: P. J. Platts et al., "Delimiting Tropical Mountain Ecoregions for Conservation," Environmental Conservation 38, no. 3 (2011): 312–24, accessed through Dryad Digital Repository, http://datadryad.org/resource/doi:10.5061/dryad.c5310, on 16 June 2014.

The Usambaras form part of the Eastern Arc Mountains, a series of geographically isolated massifs, or inselbergs, rising from the surrounding plains. The mountains were uplifted over thirty million years ago. They are now heavily weathered and intersected by numerous stream valleys. Farmers cultivate both the valley bottoms and the steep slopes surrounding them to grow a variety of food and cash crops. In some regions of the mountains, people invest sustained labor in building and maintaining farming terraces and irrigation furrows.

The massifs run roughly north to south from the Kenya-Tanzania border to Malawi, most of them less than 100 km from the Indian Ocean coast. Their location, just south of the equator and relatively near the ocean, exposes them to monsoon seasons associated with the annual movements of the Intertropical Convergence Zone. Once the monsoon storms hit the mountains, their rain falls differentially over the rugged terrain, with the southeast-facing slopes receiving the most intense precipitation. Rainfall amounts decrease as one moves to the northwest. The complex topography also creates a number of microenvironments along elevation gradients. In the Eastern Arc, long-term climate stability, elevation, aspect, slope, geology, and biological evolution have combined to foster very high levels of species endemism and diversity in mountain forests.[5]

Since the 1880s, the Eastern Arc has attracted the interest of European natural scientists. Important work was done on biological diversity in old growth forests during the German era (late 1880s–1916). More recently, the Eastern Arc Mountains have become

5 Neil Burgess et al., "The Biological Importance of the Eastern Arc Mountains of Tanzania and Kenya," *Biological Conservation* 134 (2007): 209–31.

internationally known as biodiversity hotspots deemed worthy of intensive study and strict protection. Organizations like the International Union for the Conservation of Nature, the World Wildlife Fund, various offices of the United Nations, and many other organizations seek to save the Eastern Arc forests from loggers and small-scale farmers. Working in concert with these international efforts and as part of the Convention on Biological Diversity, the Tanzanian government has designated some Eastern Arc Forests as National Parks (Udzungwe and Amani), thus giving them strict legal protection on paper. Conservationists have generally supported government actions that restrict access to forests, and have worked together with the governments of Kenya and Tanzania to increase the number of designated conservation areas across the Kenyan and Tanzanian highlands. Much published work in the social sciences and the humanities has sharply criticized these efforts on the grounds that they unfairly displace farmers.[6] The situation has led to a sharp divide between conservation approaches in the academy.

Natural scientists who advocate for forest preservation in the Eastern Arc portray mountain forests as fragments reminiscent of much larger tracts in former times. The remaining pieces serve as extraordinarily valuable places for the study of the earth's evolution over very long timescales. Despite a long history of human interaction with the land, research and advocacy from the biological sciences tends to assume human activity is axiomatically destructive. While ecological degradation is part of human habitation in the Eastern Arc, farming and herding communities have been using the mountain forests intensively for iron smelting, agriculture, and pastoralism for more than two millennia. Forest regrowth is also part of the history of human land use.[7] Human history and forest history have long been intertwined in important ways.

The Practical Issues of Working in East Africa

Without significant collaboration and help from African colleagues in the archives and institutions of higher education, and without the generosity of Tanzanian citizens across

6 For Mt. Meru and Arusha National Park, see Roderick Neumann, *Imposing Wilderness: Struggles of Livelihood and Nature Preservation in Africa* (Berkeley: University of California Press, 1998). For a broader vision of conservation as an industry in Africa, see Daniel Brockington and Katherine Scholfield, "The Conservationist Mode of Production and Conservation NGOs in sub-Saharan Africa," *Antipode* 42 (2010): 551–75; for the Eastern Arc Mountains, see Christopher Conte, "Forest History in East Africa's Eastern Arc Mountains: Biological Science and the Uses of History," *Bioscience* 60 (2010): 309–13.

7 See James Fairhead and Melissa Leach, *Misreading the African Landscape: Society and Ecology in a Forest-Savanna Mosaic* (Cambridge: Cambridge University Press, 1996).

the country, I could not conduct historical research there. Even with their help, assembling and executing a research plan takes time, local knowledge, patience, and funding. Unfortunately, grants and fellowships for Africa research in the social sciences and humanities are limited in number. By the standards of the natural sciences, humanities research in Africa draws very small amounts of money. Given this paucity of major funding, multi-year research stints in Africa have become a rarity. Nonetheless, many American Africa specialists do piece together smaller grants for shorter stays.

The Tanzanian National Archives, a rich source for environmental history, are in Dar es Salaam, Tanzania's lively capital city of several million people.[8] Before moving to the sources, however, researchers must collect adequate permissions from the relevant agencies in the host country, a process that usually takes a couple of weeks.[9] "Dar" is expensive, hot, and crowded. Simply moving from office to office by vehicle can take hours and much energy. Once the paperwork is in place, however, researchers receive fairly open access to important archives and government collections. The German and British colonial documents include scientific reports from scientific research stations, administrative reports on agriculture and forestry, and annual and semi-annual District and Provincial reports on local political conditions.

Unfortunately, insects have eaten many of the German administrative reports, but some remain readable. These archives constitute the bread and butter of most scholarly studies of Tanzanian history. Other important environmental history materials are in the survey office near the harbor. They hold aerial photographs, maps, and tracings.

Mining district and provincial offices can yield vital information. In 1992, I was lucky enough to gain access to a number of files from the District Natural Resources Office in Lushoto. An officer for the Ministry for Natural Resources generously opened a closed closet door and pulled out a stack of files that turned out to be reports from British forestry officers for the period between the early 1920s and the 1950s. Among other documents, the files included "safari reports," a daily accounting of the obser-

8 Dar's population is anybody's guess. Census data puts the figure at 4,364,541. See *2012 Population and Housing Census: Population Distribution by Administrative Areas*, National Bureau of Statistics, Ministry of Finance, Dar es Salaam, Office of Chief Government Statistician, President's Office, Finance, Economy and Development Planning, Zanzibar, March 2013.

9 In Tanzania, one cannot conduct any research, be it archival or in the field, without a permit from the Tanzanian Commission on Science and Technology. Photography requires permission from the Ministry of Information. Researchers must also be Tanzanian residents.

vations of forestry officers who were riding on horseback or walking the Usambara Mountain Forest Reserve boundary survey line that the Germans had established in the early 1900s. The reports added surprising depth to the forestry files and reports from the National Archives.

Oral History and Landscape Readings

Although important, the colonial sources contain very few African voices. In the Usambaras, most men and women have invested much labor into gardening or herding cattle in the mountains. In the 1990s, I found that important indigenous knowledge remained with my informants, but that was 20 years ago. Some elders could walk the hillsides and point out small dams and furrows and tell the stories associated with the place. Knowledgeable informants could also describe a particular landscape's value in economic, ecological, or cultural terms, telling the stories of places imbued with spiritual and aesthetic value. Some of the elders reached back into the German era for memories of labor requirements, evictions, and allegorical tales from the early missionaries.

The Fieldwork

When I arrived in August of 1991, I gathered my permissions and went to work in the Tanzania National Archives. In October, I rented a house in the central part of the mountains at a place called Mkuzi and purchased a small 1972 Suzuki jeep (800 cc engine). Every day during my first few weeks, I walked local roads and paths, greeting people along the way. Rural people in Tanzania are generally highly sociable and so greetings often led to conversations, which inevitably turned to my intentions. People often suggested names of knowledgeable informants. The hikes also helped me to get a feel for the landscape and how people worked on it and moved across it.

English was not an option in most of these interactions. Field research with oral informants requires at the very least a basic fluency in Kiswahili, Tanzania's national language, and some familiarity with the vernacular languages spoken in a given region. People in the Usambaras usually speak two or more languages. Therefore local, multilingual research assistants are absolutely essential to gathering and interpreting oral testimony. I got lucky when I happened to give a lift to a local high school teacher. After I laid out my plans to my passenger, he told me about one of his colleagues who might be interested in working with me. That is how I came to meet Peter Mlimahadala, a high school teacher who had recently finished a BA in history from the University of Dar es

Salaam. Peter belonged to the Mbugu ethnic group, and he spoke the other two indigenous languages of the Usambara Mountains, Kishambaa and Kipare. Peter is also blind and had attended the Irente School for the Blind in Lushoto, where he learned to type and to read braille. Peter was a brilliant conversationalist and he developed into a charismatic and dogged interviewer. Peter's grandfather, Mlimahadala, had been a highly respected and well-known chief in the central region of the Usambaras, so his name lent a certain weight to our various encounters. We had the good fortune to conduct almost all the interviews in the vernacular with Peter immediately translating for me into Kiswahili, which most informants also spoke fluently. They could therefore point out mistakes or omissions in Peter's translation to me.

Figure 3: Mbamba ceremony. The *regulo* (district chief) of Kanda carries out the Mbamba ceremony on behalf of the author. It is customary practice for a visitor to Gorongosa Mountain to obtain the blessing of the *regulo* for a safe journey. Photo courtesy of the author.

Despite their importance, oral history and traditions rarely lend themselves to easy interpretation and integration into a text. Memories do not come to mind without interference from the contemporary context. In the case of the Usambaras in 1991, the German aid agency, Gesellschaft für Technische Zusammenarbeit (GTZ), was in the process of implementing the Soil Erosion Control and Afforestation Project (SECAP), which in many ways mirrored very similar colonial efforts in the 1940s and 50s. People often wanted to discuss their grievances with SECAP in the context of earlier colonial efforts, which they likewise saw as unjust impositions.

I worked from a set of questions and talking points that I continually refined and revised. Peter and I discovered quickly that individual informants had different sets of expertise, experience, and knowledge. As our body of evidence grew, we developed follow-up questions and often visited informants for subsequent sessions. Stories of "hungry years" surfaced again and again in the recollections of agrarian history. While the famine histories emphasized the causes of crises, they tended also to explain strategies for mitigation. The process might involve gardening in marginal areas—since rain-fed agriculture was impossible, difficult-to-work places like swamps were cleared, burned, and cultivated—or implementing technological fixes like irrigation.

The forest itself is a historical source. As I mentioned above, some pieces of old growth forest still cover the Usambara Mountains. The botanical composition of the fragments can reveal much about settlement history. A grove of camphor and mahogany trees, for example, may point to abandoned garden sites. Detailed landscape readings are available in the documentary sources as well. The quality of the descriptions varies from slipshod reminiscence to careful observation of biogeography, demography, settlement patterns, and agricultural potential.

An Accessible Past: Public History

In the future, environmental historians of East Africa's highlands should expand their audience from scholarly circles and give an accounting to the people about whom they write. A publically accessible and well-informed interpretation of a place's history can enrich a community, especially in places where people are at odds over land. Recall the Mozambican student who is writing an environmental history of the southern Rift Valley at Gorongosa National Park, a place riven by violence between 1978 and 1992. In an effort to support the process of social and ecological restoration, he intends to make available the hundreds of stories he has collected from elders. Stories of societal health and biological productivity might then be told alongside those of violence and warfare.

Figure 4:
From left to right, Seuya, Baharia, and Mlimahadala, 1992. Mzee (term of veneration for an elder) Seuya was a priest and held a great deal of cultural and historical knowledge about the Mbugu people. He was well into his nineties at this time. Baharia was Seuya's nephew and helped to clarify when Seuya's memory failed him. Mlimahadala was the author's research assistant.

Marcus Hall

Conspicuous Elevations and the High Art of Posing the Right Question

In the first sentences of his 1936 treatise on mountains, geographer Roderick Peattie confidently declares that "a mountain, strictly speaking, is a conspicuous elevation of small summit area." Conspicuity, he explains, is an essential yet indefinite element of a mountain and "depends upon the personal evaluation or the standard by which it is measured." A mountain may therefore be a few hundred feet or a few thousand feet high, depending on the observer.[1] We begin to realize why mountains have been so inspirational to hermits and heretics, soothsayers and soul searchers, poets and scholars. If *nature* is the primary concern of environmental historians, eliciting dozens of interpretations, *mountain* is also rich with connotations and denotations. Mountains are what we want them to be, and so make ideal subjects for learning about ourselves and our histories.

I have always lived in or near conspicuous elevations, or longed for them. For whole years at a time, whether at the foot of the Rocky Mountains, the Alaska Range, the Andes, the Alps—or Blue Mounds, Wisconsin (a barely perceptible rise on the horizon that only flatlanders learn to appreciate)—I thought I saw conspicuity. Swept up in a "transnational" world and the call for "comparative" histories in graduate school, I decided to write my own doctoral dissertation comparing Europe's Alps with America's Rockies. Surely here were two famous mountain ranges that deserved more simultaneous attention. Both ranges had served as my refuge, and putting them side-by-side seemed an ideal way to make sense of the world and my place within it. All histories are ultimately biographies of sorts. So I might as well embrace my own past by writing about something that I knew. Besides, academic advisors oft repeated that one must choose a doctoral project according to its ability to enthrall and entice its creator, even on the rainiest of days, for it was a long journey between topic selection and book publication. Juxtaposing these two mountain systems was therefore my subject as well as my method. Now all I needed was a question.

In confronting the challenges of "doing" environmental history—as in most pursuits—the practitioner is always better off when asking the right question. Of course one of the first ways to know which question to ask is to read widely and converse with experts in the

1 Roderick Peattie, *Mountain Geography: A Critique and Field Study* (Cambridge: Harvard University Press, 1936).

Figure 1: Restoring watersheds in the Italian Alps with check dams, ca. 1890. G. di Tella, *Il Bosco Contro il Torrente* (Touring Club Italiano, 1912).

field. By learning more we realize what isn't known, and so we begin to identify what cries out for greater understanding. But there is more to identifying the right question than going to the library. In what follows, I offer my own ruminations on how one best approaches a research topic and then selects a crucial question. I tidily (and somewhat facetiously) categorize the challenge of selecting the right question according to the five *P*s: Personal, Practical, Procedural, Professional, and Public criteria. Although such issues will be second nature to many scholars, reviewing some of them here may aid those who are just setting out toward their own conspicuous heights. A bit of reflection now may save a few from pursuing unrealistic, uninteresting, or unanswerable questions later.

Personal Interests

As mentioned, the best question is often one that is integral to one's own background, so that one can already identify some of the questions that need asking. During our 2013 Graduate Summer Workshop in Switzerland, scholarly climbers investigated climbing

Figure 2: Restoring watersheds in the Utah Rockies with contour trenching, ca. 1930. W. Bailey and A. Croft, "Contour Trenches Control Floods and Erosion on Range Lands," *United States Forest Service Publication* 4 (1937).

histories, scholarly skiers investigated skiing histories, and scholarly environmental activists investigated environmentalist topics: their passion and knowledge reflected more than impersonal learning. My own dissertation topic had been about restoration history, using mountains as places that had been deforested and degraded, and then in some areas, reforested, restabilized, and rejuvenated. I felt that the conservation pursuit of ecological restoration deserved historical reflection, and I believed that mountains were a good place to explore the restorative enterprise. What had been the experience of mountain restorers? Had Rocky Mountain and Alpine restorers practiced their craft differently? Even if my dissertation topic was not immediately relevant to my advisory committee, I felt that this research was still worth pursuing, for it was satisfying to me personally. I was and am concerned about ways to fix a damaged earth, and I was intent on offering rigorous insight into stories that did not show merely decline and despair. Mountains became my laboratory for exploring how humans had wrestled with environmental repair.

There was the other pragmatic fact that in those graduate school days, I consumed most of my jet fuel traveling back and forth between my selected mountain ranges. My family lived at both ends of this mountain divide, and I would be making my way between these ranges regardless of which doctoral project consumed me. Such family issues also meant that language, too, was working on my side, for I realized that dealing with obscure archival records would require a good command of the local vernacular; fortuitous earlier circumstances meant that I could handle Romance tongues reasonably well but not Germanic ones. Clearly my research questions and my study sites in the Alps were better centered on valleys draining into the Po and Rhone than into the Rhine and Danube. While I admire those who simply throw a dart on the world map and then set out to learn more about that place, I did not want to spend extra graduate school years just acquiring another language or two before I could begin to wonder which questions might be asked.

Practical Matters

Challenging logistics are part of every research project and question. Thus, winter is a bad time to carry out field research in temperate mountains, unless snow and ice are fundamental to one's research question. August is a bad month to expect easy access to Italian archives. Pursuing almost any question that requires viewing Italian Renaissance military maps, moreover, will require special perseverance, as it is certainly easier to be granted an interview with the Pope than to gain admittance to the library of Florence's Istituto Geografico Militare. Part of my own project would eventually trace landscape changes over the last one hundred, but not the last five hundred years, as the availability of cartographic data modified the questions that I asked. In his own graduate school days, one of my dissertation advisors spent a year as a research assistant bringing order to a dusty storehouse of land-use records, which then became a primary source for answering his own dissertation questions. Certainly Machiavelli would have used his own contacts and influence to plan his historical career, including the way he crafted the questions that he might have pursued. Of course, this is not to say that graduate students should be devious or immoral in identifying their own questions—but at the same time, opportunism should not be excluded from a researcher's toolbox.

Thinking about scale (as shown by Emily Wakild's essay) is also key to crafting the right question, for our projects cannot be too large or too small. "Global" environmental histories should be attempted only by the brilliant or the foolish, as it would seem (despite Braudel's call) that there can be no such thing as *total* history. We always need to choose pieces of the past to focus on: a three-year project requires a three-year question; a three-month project, a three-month question. The scope of a master's thesis is not that of a doctoral thesis, and the question being answered must be adjusted accordingly. With his book *In 1926*, Hans Gumbrecht demonstrated that it is possible to write a whole book about a single year (and presumably other books about a single month or a single day), but most histories still address a handful of years or centuries.[2]

Students in my own "Topics in Global Environmental History" course often pose sensational questions for their own research projects, but ones that would require much more time than they have allocated. Rather than advising young researchers to "narrow their

2 Hans Ulrich Gumbrecht, *In 1926: Living on the Edge of Time* (Cambridge, MA: Harvard University Press, 1998).

topic," it may be more fruitful to suggest that they narrow their question, for example by time, space, or scope. In my own first major research project, I asked how reforestation and erosion control may have differed between a valley in the Alps and one in the Rockies. In retrospect, I am sure that I was lucky to have not sought to compare a third valley, or to extend my study much beyond the last century or two. Research questions are often reduced, refined, or redirected as one confronts practical limits of time and funding. One's *magnum opus* is usually best left until after graduate school.

Procedural Concerns

Linked to the practical considerations of selecting a good question is the process of identifying the steps needed in order to answer it. First off is usually the required literature review, or historiographic survey, which typically reveals how little is known about one's topic, but how much is known about everything else. Yet almost without one realizing it, this background reading often reveals obscure archival repositories, noteworthy people or places, and (crucially) ways for honing one's original questions. After reviewing this historiography, one can better settle on an optimal case study, identify fruitful narrative techniques, and reveal the extent to which comparison may be necessary or superfluous. As an aside, I have heard claims that all history is comparative, whether between past and present, between ideas of one person and the next, or between landscapes here and there: as a result, self-conscious comparative history is not often needed for presenting useful answers to a question. In the end, the project of "reviewing the literature" may in the best of scenarios lead to other, seemingly unrelated bodies of literature. Indeed, demonstrating links between two seemingly disparate bodies of knowledge is what the best history projects do.

The process of crafting an exciting question should never be formulaic, as research always presents serendipity. In the throes of a different research project, I remember sitting down one morning at the long oaken table of the big state archives in Rome, waiting for "my" boxes of records to be carted out, and then being notified that the boxes were already in use. At the other end of the table, I spied a senior scholar who was immersed in those very records. With some inquiry, I found out he had been wrestling with some of my same questions—except that he was far ahead of me on this pursuit, just then crossing t's and dotting i's on a manuscript heading to press. Luckily for me, a subse-

quent conversation with him showed that he had steered clear of one area that seemed particularly fruitful, and so I realized then what would become my own research focus. A chance encounter in Rome shifted my whole project. Perhaps knowing when and how to act on such encounters is the artistic side of carrying out research.

There are the databases that one must check, such as Google Scholar or JSTOR. There are the writing manuals to glance over, such as Atchity's *A Writer's Time*.[3] Advanced graduate students will be way ahead of the curve if they thumb through any of several how-to guides in converting theses to books. All such exercises can highlight how one's initial question may be too large, too obscure, or too academic. Does your question catch the attention of your friends, or are you almost embarrassed about your obsession with a particular puzzle? Instead of explaining to them what your research is about, try announcing the questions that you aim to answer. Expect such questions to change as you work further on your project.

Professional Considerations

My own comparison of the Rockies and the Alps was an apples and oranges affair. Probably every comparison is strained, because deeper inspection reveals that both sides are always different from one another—but that is why you compare them. The Alps are jagged and populated; the Rockies are mostly rounded and uninhabited. The Alps underwent gradual deforestation and sustained grazing while the Rockies witnessed dramatic changes in land cover and land use. Pressures to rehabilitate and reinstate wildness were much greater in the American mountains. It was precisely the differences that made this transnational comparison so appealing to me. I believe that almost any kind of comparison is possible if one can identify the necessary constraints on how to go about doing it. In comparing disparate mountain ranges, especially through the eyes of travelers, I had responded to my own guild's call to consider two or more phenomena or regions simultaneously. In retrospect, the decision to consider both mountain ranges was a good choice, one that required an extra year or two in the archives, extra practical and procedural considerations, and one that may have produced extra insights. But the comparative choice was also influenced by peers and

3 Kenneth Atchity, *A Writer's Time: Making the Time to Write* (New York: Norton, 1995).

mentors. Is trendiness a legitimate motive for selecting a question? How much should we mold our interests to meet the pressures imposed by our colleagues?

Professional realities typically mean that historians, for example, need to pose questions that can lead to one substantial monograph; that promote the development of intriguing opportunities for teaching and outreach; that are sufficiently captivating to a non-expert to attract outside funding; and that can intrigue the upper echelons of one's field, university, or established community.

But the problem with pursuing *hot* topics—going where there is money—is that by the time one is deeply immersed in the relevant questions, such questions may be stale. Besides, there are so many other unknowns out there begging for attention. Climate history is fascinating stuff, but today's budding climate historians should be seeking more than better proxy information for estimating the nineteenth century's warmest summers. At the same time, rugged individualists who set their own research courses risk becoming irrelevant to the greater community of colleagues who may want to hear about their work. It would be too simple (and too simple-minded) to brush aside the trendy work of others and head off blindly into unknown lands. Perhaps one's stage in the professional ladder helps influence how bizarre one's question may be, with the most securely employed scholars being able to pursue the most unorthodox research agendas. But I would like to think that those posing the most unlikely questions should enjoy some of the best prospects to continue funding their projects. Perhaps one should still pursue topics acknowledged as being crucial, but utilize unusual methods or sources when seeking to answer them.

In the best of all worlds, budding researchers would be able to develop their own questions, rather than be handed one from an advisor, book, or other authoritative source. The more a researcher is constrained by the question handed down, the more creativity is compromised. We must be suspicious of the practice of allowing senior scholars to set research agendas. Alternatively, if the only way of securing funding or employment is to play lip service to Kuhn's Normal Scientists, so be it. But when those checks finally start rolling in, researchers should be free to readjust their course toward more pressing questions at hand.

Public Issues

Beyond acknowledging professional considerations, one must also pay attention to public relevancy. I have heard it argued (by someone I admired) that today's researchers can no longer afford the luxury of asking merely theoretical questions, for we have far too many other pressing questions confronting us. Of course the easy rejoinder to this plea is that we cannot easily predict which questions will turn out to be most useful. The historical profession itself is not very relevant to a large fraction of the public, for it seems that historians are mostly preoccupied with a few dead men and (fewer) dead women. Ongoing public involvement is required to convince our skeptics that revealing the roots of a problem is a crucial step in figuring out how to resolve it.

What the above promoter of practical research meant to say, I think, is that researchers must seek to answer exciting questions, ones that stimulate us to think in new ways, that uncover strange facts or trends that we did not know existed, and that may provide different angles for viewing familiar scenes. Questions that aim to add "building blocks" to a pyramid of knowledge that we already know the shape of are not very stimulating. Researchers isolated from society's current challenges are likely to be pursuing tired questions, unconnected to the real world. Environmental historians foster delicate relationships with environmental activists, and our research questions should animate both groups. And yes, I believe one of our highest achievements is to gain the attention of the general public. Whoever that public may be, it is certainly our highest critic and the one that is most difficult to satisfy. Dissertations are better crafted as drafts of books, rather than as academic treatises. The disparaged "journalistic account" may actually teach a historian a thing or two about fresh writing.

Answering questions for our publics may also include not writing at all, or at least not writing on paper. I am convinced that audiences are not becoming more illiterate, even though one source says that just a fourth of Americans read a book last year. Europeans are apparently better bookworms, but they too increasingly forego books.[4] More and more, our readership absorbs their ideas by other means: orally, visually, and if in written form, more briefly but more frequently. TED talks have now exceeded a billion view-

4 Jordan Weissman, „The Decline of the American Book Lover," *The Atlantic*, 21 January 2014. Reportedly, European bookless rates last year varied from 10 to 50 percent depending on country. See "Europeans Turning Their Backs on Culture, Survey Says," *EUobserver*, 5 November 2013, accessed 27 February 2014, http://euobserver.com/news/121987.

ings.[5] Clearly we need to put more of our answers on webpages and social media, even if this requires reshaping the length and style of our messages. We might pursue more questions that lend themselves to 10,000 words and a Vimeo spot rather than 100,000 words and two hard covers. People are more curious than ever, but they are less willing to plod through dense prose offering opaque answers when there are more captivating and more informative sources available.

Mountains make captivating subjects. Our graduate seminar in eastern Switzerland did not spend all of its hours inside a climate-controlled conference room. On one sunny afternoon, the group of us went outside and hiked a trail to a meadow. We watched each other admiring the scenery, where conspicuous peaks stood above and a lake lay below. Inside that national park, we were not permitted to leave the trail, as this protected area is a strict nature reserve, and our controlled admiration of it demanded questions. Why were most of us glorifying mountains more than wetlands or the plains? Who had decided we could not leave the hiking paths, and whose interest did the park's present status best serve? Why in that moment did we cherish a hot sun, and appreciate nibbling our sandwiches away from the luxury indoor comforts that awaited us that evening? How did a glance from that viewpoint represent a landscape—a *Landschaft*—that had been *crafted* to conform to our expected view? And where would that side-path following the ridge take the more adventurous hiker?[6] These were all good questions, questions that could lead to other questions, and might stimulate a few of us, if not to try to answer them, then to find out how others might have answered them.

5 "TED Reaches Its Billionth Video View," *TED Blog*, 13 November 2012, accessed 27 February 2014, http://blog.ted.com/2012/11/13/ted-reaches-its-billionth-video-view/.

6 On the environmental history of the Swiss National Park, see Patrick Kupper, *Creating Wilderness: A Transnational History of the Swiss National Park* (New York: Berghahn, 2014). My own mountain answers are reported in *Earth Repair: A Transatlantic History of Environmental Restoration* (Charlottesville: University of Virginia Press, 2005).

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All contributors participated as faculty in the ESEH graduate student summer school "Mountains across Borders: A Summer School in Environmental History," held 17–21 August 2013 in Lavin, Switzerland.

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This issue of *RCC Perspectives* uses mountains as a common denominator around which to discuss overarching challenges of environmental history: challenges relating not only to mountain landscapes, but also to broader questions of sources, methods, cross-cultural research, project scale, and audience. Each author discusses some of their most intriguing discoveries, resulting in a brief and diverse collection of environmental history snapshots. At the same time, authors reflect on the process of doing environmental history, relating specific setbacks and opportunities they have faced. The volume thus offers a sort of handbook of advice and encouragement to other scholars. Portraying both a demanding project and a trove of fascinating results, this volume uses mountain landscapes to trigger wide-ranging reflections upon the pursuit of environmental history.

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