



Deborah R. Coen. *Climate in Motion: Science, Empire, and the Problem of Scale.* Chicago: University of Chicago Press, 2018. Illustrations. 464 pp. \$40.00, cloth, ISBN 978-0-226-39882-2.

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Published on H-Sci-Med-Tech (September, 2019)

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Accommodating Difference, or How to Write about an Empire in Motion

Deborah R. Coen's *Climate in Motion: Science, Empire, and the Problem of Scale* is a history of the culture and practice of climate science in the Austro-Hungarian Empire in the late nineteenth and early twentieth centuries. Coen demonstrates a mastery of historical knowledge about the socio-economic, political, and cultural context; about the empire's scientific institutions and practitioners; and about a considerable number of branches of scientific inquiry. *Climate in Motion* is rich and very readable on these topics, and it makes some interesting and important interventions in the historiography of science on the issue of "scale." The approach Coen takes, while creative, is not, however, entirely unproblematic, especially in its ambition to create an alternative genealogy for contemporary climate science that supports epistemic pluralism (as I outline below). Nonetheless, the book will be of significance to a wide readership in the history of science and the environmental humanities.

Climatology in the Habsburg was born of a system that was unique in its accommodation of difference (of types of environment, of scientific methodologies, of institutional practices, and of scales of analysis) within a single framework. This coincided with the imperial political goal of inte-

grating "indigenous places" into "imperial space" without flattening their difference (p. 10). This, in turn, complemented a view of an imperial economy that relied on its environmental difference to produce diverse natural resources that could feed intra-imperial exchange. This context, Coen argues, generated a view of climate that was more complex, multi-scalar, multidisciplinary, and multicausal than in other parts of the world, notably in its ability to value both locally derived detail and synoptic modes of analysis.

Part 1 presents the historical context from which Habsburgian interest in climate emerged. The chapters recount the political origins of the Austro-Hungarian Empire and the genealogy of various forms of scientific institutions. Attempts by the royal elite to generate coherence for the empire as a political unit relied on a clever double move—the celebration of "Unity in Diversity." The diversity of environments, languages, and cultures was celebrated as a strength that was both intellectually and economically productive. A science that described the empire was compelled, therefore, to move iteratively between the idea of a "whole" and that of parts and details, universals, and particulars. Chapter 1 looks at the institutions and intellectual traditions of natural history. Chapter 2

looks at the “idea” of Austria and, in particular, the ways the designation of cultural and natural monuments was used as a strategy to create a trans-imperial cultural commons. Chapter 3 focuses on the ways “Unity and Diversity” as a political idea encouraged scientific personae that were spiritually and intellectually inclined to be able to marry sweeping thought and attention to apparently mundane detail. Chapter 4 describes the practical difficulty that institutions faced in trying to balance imperial and provincial ideals and shows how this shaped observational networks.

Part 2 follows a very loose chronology between the 1840s and the 1920s, showing dynamic climatology as emerging from commonalities in a variety of natural historical investigations, the investigation of systematic observational data collection projects, the synoptic expression of the data in cartographic form, and the development of mathematical and experimental forms of the science. Specifically, however, the four chapters focus on changes in epistemic practices and values that typified the nature of Habsburgian climatology. Chapter 5 considers the role of new mapping techniques that could adequately communicate widely variable scales of geographic differences, such as a graphic depiction of land elevation that could accommodate both the dramatic peaks of the Alps and areas with gentler landscapes. Chapter 6 describes the development of new genres of writing that could bridge perspectival scales. Chapter 7 explores the idea that difference between two areas could be generative, through the history of wind movement, the health sciences, and economics. Chapter 8 describes a shift in thought around exceptionalism: from seeing storms as anomalies within stable climate systems to seeing storms as an inherent part of dynamic systems.

Part 3 is titled the “Work of Scaling” and brings together three very different kinds of study. Chapter 9 explores the relationship between the scales used in climate science and the politico-legal debates around the environmental impact of defor-

estation. Coen describes how these debates created an imperative to describe the climatic effect of forests on their surroundings, leading to interest in climatic variation at a micro-level. Chapter 10 describes the ways the environments of the Austro-Hungarian Empire offered new ways of thinking about and observing difference within and between plant species. Chapter 11 considers the emotional and ethical challenge of reconciling the shifting senses of the familiar that were provoked by “rescaling.” It asks how the private writing of two “imperial-royal” scientists might be used to understand the psychological experience of changing intellectual and affective perspectives.

Taking up the question of historiography, one of the major contributions of *Climate in Motion* is in offering a very polished example of how geographical categories can be read “along” the grain.[1] Over the last decade, there has been a growing rejection of the use of political units as “wholes” about which one might write.[2] In some instances, the meta-category of “global” histories of science has been offered as an antidote to national, imperial, or even regional history, categories that might be seen to obscure as much as they reveal. Yet it seems that geographical “wholes” can still offer purchase where we attend to how they are being perceived and performed by the actors concerned. Coen’s book does interesting work by articulating the process through which imperial climate science was complicit in both challenging and reifying particular scales of thought and experience.

Coen cites her inspiration for this approach as stemming from John Tresch’s ambition to interrogate the “cosmologies” of science and from examples of scalar analysis by Richard White and Benedict Anderson.[3] However, Coen adds to the techniques available for this kind of historical writing by borrowing from her Habsburgian subjects. It is both fascinating and charming to see Coen replicating the “work of scaling” that in the nineteenth

century was being used to represent climates, in *her* representation of *their* social world.

A first shared characteristic between *Climate in Motion* and Coen's definition of "imperial-royal" science is multi-perspectivalism. Coen uses multiple techniques, tools, and points of view to present complexity innovatively, building on existing forms of writing large-scale histories of science and adding to the toolbox of techniques available to historians. In a now classic article from 2004, Sujit Sivasundaram focused on cross-contextualization—the reading of sources and reconstruction of scientific exchange from different directions.[4] More recently Stuart McCook proposed the technique of "following" (material, ideals, and people) as an analytical approach that subverts or rejects geographical categories.[5] This was used to great effect in Rohan Deb Roy's recent book, *Malarial Subjects: Empire, Medicine and Nonhumans in British India, 1820-1909*, in tracing the emergence of a global understanding and definition of the disease. However, Coen's writing feels less programmatic and shifts fairly regularly between a huge variety of spatial and temporal scales, from intensely personal diary confessions to broad trends across distinct forms of scientific endeavor.

In part 1 where Coen describes the relationship between the sociopolitical context and the characteristics of "imperial-royal" science, she uses a kind of mosaic structure, presenting clusters of related ideas and situations that she picks up and puts down like samples in a collection. Part 2 draws more heavily on biographical vignettes as a means to describe how intra-imperial mobility between sites, disciplines, and embodied environments influenced forms of scientific thinking. Part 3 is the most diverse, with a reflective and surprising chapter on methodology placed right at the end. These shifts feel fluent rather than stylistically self-conscious and offer an interesting model for historical writing about scale.

Another epistemic technique that Coen borrows from the climatological research of her sub-

jects is using "imperial-royal science" as a category that is strongly defined but not clearly bounded. In Habsburgian climatology, Coen tells us, the attempt to map out regions and the use of particular scales of analysis were beneficial not because of the representational accuracy of the categories they created but because the deliberation of those categories was so intellectually generative. Coen's category of Habsburgian imperial-royal science seems to operate in a similar way.

For Coen, the dominant characteristic of the Austro-Hungarian scientific culture is the productive internal tension between central imperial and provincial points of view. She proposes that the basic shape of climatological investigation is the result of this peculiar intra-imperial dialogue, and not the result of the relationship of the Habsburg Empire to other nations or empires. Scientists at work in other locations are considered to be working under other "scalar" paradigms, yet discussion of the influence or even existence of climatological discourse from elsewhere is muted.

Coen suggests a similarity between the motivations of Habsburg scientists and those based in other land empires, including the United States, Russia, and India. Occasionally she mentions the contribution of non-Habsburg scientists to "Habsburgian" modes of thinking (or vice versa), including dialogue with Alexander Voiekov in Russia, C. H. D. Buys-Ballot in the Netherlands, or Robert de Courcy Ward in the US. In the final chapter, Coen describes how the climate scientists' scalar imaginaries were shaped by travel beyond the limits of the empire. However, she rarely offers a sense of how the exchange of scientific ideas and data happened with actors or organizations beyond the empire, and it isn't until the conclusion that we learn that, in 1873, Vienna was the site of the First International Meteorological Congress or that Austrians led the first International Polar Year of 1883. In making the case for the productivity of the internal tensions of the Habsburg scientific culture,

she almost erases its connectivity to a larger set of discussions.

The regional characteristics of climatological scientific practice, while beautifully drawn, feel more convincing in some moments than in others. While I enjoy Coen's act of connecting the sociopolitical infrastructure of the Habsburg Empire to pluralistic forms of science, I find Coen's stronger expression of pluralism as "belonging" to Habsburg scientists a little harder to buy. Coen uses a quotation from 1919 by Jewish Czech-German geographer Julie Moscheles on pluralism, who compared the "life and soul of all human beings" to the diverse forms taken by water in different environments, "a little modified by circumstances but always to be recognized and loved" (p. 348). For Coen this metaphor is associated with a Habsburg "imperial-royal" scientific perspective. I would have been interested to know where and whether traits that Coen identifies as Habsburgian are clearly differentiable from late nineteenth- and early twentieth-century forms of scientific and political internationalism.

A more significant difficulty I had with Coen's work was her portrayal of the Habsburgian imperial ideals as largely benign. Predominantly Coen describes the imperial-royal work of scaling and concurrent intellectual pluralism as having a politically progressive impact (a special kind of empire), particularly in contrast to narrower and exclusionary nationalist politics. Coen acknowledges the expression of racist prejudice, exoticization, and sometimes hatred of the non-Germanic peoples of the Austro-Hungarian Empire by some of the imperial-royal scientists. She recounts the ill-effects of these prejudices on scientific practice and on the life courses of particular scientific practitioners. Yet although Coen writes "scaling" as an ethical process, I do not feel convinced that she tackled this with enough force.

In chapter 11 and in the conclusion, particularly, Coen argues that scaling necessarily produces moments of affective recalibration that

manifest in feelings of longing and loss, seductions of the exotic, and pangs of homesickness. However, Coen's consideration of the effects of recalibration, the accommodation of "unity in diversity," is taken from the point of view of those establishing new synoptic worldviews. That process is not considered from the point of view of those imperial subjects—peasants, guides, prostitutes—who are relegated to the roles of "landscape features."

The book begins by stating the importance of recognizing "scaling," with a note that history of science "must ... attend to the tools and practices of commensuration, which are not limited to measuring instruments in the traditional sense" (p. 17). Coen situates this project within environmental history, and the history of science, but additionally argues for the wider value of attending to the phenomenology of scale in the context of contemporary debates about climate science. While recognizing that the empire in question here had a very different character than other colonial empires, I think that when Coen advocates the Habsburgian approach to contemporary scientists, she might add a note of caution about the politics of scale. Despite its inclusive rhetoric, the "imperial-royal" perspective disintegrated into more than a century of political turmoil that is still ongoing. Future accommodations of difference in contemporary climate science will need to address more radically conflicting subjectivities than were included in the imperial-royal climatological conversations and will need to consider the subaltern as more than "tools of commensuration."

Despite this hesitation, this book is an extremely thought-provoking read: the journey through the Austro-Hungarian Empire; the description of an emerging science trying to describe complex change; and the portraits of people, place, and institutions using multiple perspectives are all fascinating and have much to offer. I very much hope that the project of "scaling" will be as generative of new forms of writing in history of science as it promises to be.

Notes

[1]. Ann Laura Stoler, *Along the Archival Grain: Epistemic Anxieties and Colonial Common Sense* (Princeton, NJ: Princeton University Press, 2010).

[2]. Jeremy Adelman, “Latin American and World Histories: Old and New Approaches to the Pluribus and the Unum,” *Hispanic American Historical Review* 84, no. 3 (2004): 399–409.

[3]. John Tresch, “Cosmologies Materialized: History of Science and History of Ideas,” in *Rethinking Modern European Intellectual History*, ed. Darrin McMahon and Samuel Moyn (Oxford: Oxford University Press, 2014), 153–72; Richard White, *Railroaded: The Transcontinentals and the Making of Modern America* (New York: W. W. Norton & Co., 2011); and Benedict Anderson, *Imagined Communities: Reflections on the Origin and Spread of Nationalism* (London: Verso, 1983).

[4]. Sujit Sivasundaram, “Sciences and the Global: On Methods, Questions, and Theory,” *Isis* 101, no. 1 (2010): 146–58.

[5]. Stuart McCook, “Focus: Global Currents in National Histories of Science: The ‘Global Turn’ and the History of Science in Latin America,” *Isis* 104, no. 4 (2013): 773–76.

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Citation: Elizabeth Haines. Review of Coen, Deborah R. *Climate in Motion: Science, Empire, and the Problem of Scale*. H-Sci-Med-Tech, H-Net Reviews. September, 2019.

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