The Matter of History

New insights into the microbiome, epigenetics, and cognition are radically challenging our very idea of what it means to be "human," while an explosion of neo-materialist thinking in the humanities has fostered a renewed appreciation of the formative powers of a dynamic material environment. *The Matter of History* brings these scientific and humanistic ideas together to develop a bold new postanthropocentric understanding of the past, one that reveals how powerful organisms and things help to create humans in all their dimensions, biological, social, and cultural. Timothy J. LeCain combines cutting-edge theory and detailed empirical analysis to explain the extraordinary late nineteenth-century convergence between the United States and Japan at the pivotal moment when both were emerging as global superpowers. Illustrating the power of a deeply material, social, and cultural history, *The Matter of History* argues that three powerful things – cattle, silkworms, and copper – helped to drive these previously diverse nations toward a global "great convergence."

Timothy J. LeCain is the author of the prize-winning book *Mass Destruction*. He was a Senior Fellow at the Rachel Carson Center in Munich, Germany, and a Fellow at the Center for Advanced Study in Oslo, Norway. He is Associate Professor of History at Montana State University in Bozeman, Montana.

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How Things Create the Past

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For

Douglas Shaw LeCain

&

Frances Murchie LeCain

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Illustrations

Acknowledgments

In Prague, just a short stroll from where the Charles Bridge so famously spans the Vltava River, there is a wonderful little restaurant named for the poet Rainer Maria Rilke, who was born and spent his youth in the city. I found myself there one evening a few years back, having spent the previous several days at a workshop dedicated to a theme that is also central to this book: "Object Matters." Afterward, I stayed on a few days to explore the city's Old Town, whose winding medieval streets were especially charming and free of tourist hordes in the frosty mid-December air. That evening at the Restaurant Rilke, alone at my table aside from a flickering candlestick grown companionably plump with years of dripping wax, I began to idly page through some of the books stacked nearby, all of them by or about the mystical Bohemian poet. In one, a small brown leather-bound chapbook titled *Recital*, I stumbled across a line that has stuck with me since: "... ich bin in der Arbeit wie der Kern in der frucht" – I am in the work as the seed is in the fruit.

At the time I was in the midst of writing this book, and Rilke's words reminded me that, even when I might appear most alone, I am always surrounded by the nourishing influences of countless other scholars, friends, and family – and, yes, creative objects, creatures, machines, buildings, and things like plump candles – that spark and sustain my thoughts and actions. At one level this book might be read as another argument against the still-persistent romantic-modernist celebration of the individual human creator and inventor, and if I am going to deny the great Thomas Edison his status as the inventor of the light bulb – as I do in Chapter 6 – then I can hardly claim any great powers of creation or insight for myself. In other words, here I have the somewhat daunting pleasure of

writing an acknowledgment to a book whose essential argument suggests that even my best efforts will inevitably fall badly short. How does the seed of an apple recognize the fruit that engulfs it – much less the tree on which it depends and suspends?

Still, many of my dependencies will be readily obvious. The work of Bruno Latour, arguably the most important philosopher of our time, has nurtured a tree of ideas so novel and robust as to support the fruit of countless others, myself included. I have also taken much inspiration from the work of scholars in many fields outside my own: the anthropologists Philippe Descola and Tim Ingold; the archaeologists Bjørnar Olsen, Ian Hodder, and Nicole Boivin; the political ecologist Jane Bennett; the philosopher Graham Harman; the feminist theorists Donna Haraway and Elizabeth Grosz; the linguistic and cognitive theorists Benjamin Bergen, Andy Clark, and George Lakoff; and the biologists Andreas Wagner, Lynn Margulis, and Kevin Laland. Among my own tribe of historians, the list would be much longer, and I hope my broader debts are fully evident in the text and footnotes. But to mention just a few whose imprints have been the most indelible: Richard White, Donald Worster, Dipesh Chakrabarty, Edmund Russell, David Noble, Timothy Mitchell, Langdon Winner, Thomas Andrews, Linda Nash, Mark Fiege, William Cronon, John McNeill, Nancy Langston, Julia Adeney Thomas, and Brett Walker all stand out.

Brett Walker, my friend and colleague of many years, first proposed that we collaborate on a comparative study of the environmental history of Ashio and Anaconda almost a decade ago. Our research was subsequently funded by a three-year collaborative grant from the National Science Foundation's Division of Social and Economic Sciences (Award No. 0646644), where the program director Frederick Kronz provided invaluable support and assistance. That grant permitted us to employ two talented graduate research assistants, Robert Gardner and Connie Staudohar, and their diligent work provided much of the detailed historical evidence used in this book, as well as in several other books and articles that have previously emerged out of that project. While *The Matter of History* goes well beyond the initial aims of the NSF grant to develop a much-broader argument for a neo-materialist theory and method, the empirically driven comparison between Ashio and Anaconda is still very much at its heart. I ultimately ended up writing these comparative chapters, but many of the overarching ideas are as much Brett's as mine, and he provided essential feedback and suggestions on Chapters 5 and 6, where the Japanese story figures most

centrally. His arguments on the independent agency of nonhuman organisms and things and the human bodily engagement with the material world also play an important role throughout the book.

Equally critical to the gestation and creation of this book, particularly to its neo-materialist ideas, was a wonderful year spent at the Rachel Carson Center for Environment and Society in Munich, Germany. Christof Mauch and Helmuth Trischler, the directors of the center, have created an extraordinary scholarly institution that has in the course of just a few years succeeded in making Germany one of the leading centers for environmental history and humanities in the world. My year at the RCC provided me with that most precious of scholarly commodities: the time to read broadly, to chase down intriguing intellectual leads, and to nurture new ideas. Fittingly, it was at this center, named in honor of a great American environmental scientist and author, that this book evolved from being a comparative environmental study to encompass a much more ambitious argument for a new environmental or materialist understanding of humans and their histories. I was aided in this evolution not only by the smoothly functioning support and good humor of the RCC staff – thanks especially to Claudia Reusch, Andrea Cooke, Katie Ritson, and Arielle Helmick – but also by the conviviality and intellectual inspiration of the many other RCC fellows whose stays coincided with mine. My warm thanks to Dan Philippon, Bron Taylor, Paul Josephson, Fiona Cameron, Edmund Russell, Clapperton Mavhunga, Claudia Leal, Shawn Van Ausdal, and Eagle Glassheim, among others, for all the stimulating conversations, during both our regular Thursday seminars and our decidedly more irregular seminars over beers and wurst at Munich's many charming locales. Indeed, I would be a very poor neo-materialist if I did not also express my heartfelt thanks to the city of Munich itself, a place whose tree-lined boulevards, vibrant sidewalk culture, and peaceful parks surely conspire to encourage creative thinking. The material power of great cities to create and shape our ideas is, I think, an underappreciated and understudied topic. Finally, our year in Germany would not have been nearly so pleasant and productive but for the kind assistance and friendship of our landlords, Heide and Heinrich Quenzel, and our wonderful neighbors, Lisette and Andre Talkenberg, and Andre's son Patrick Hartmann, who not only tolerated the American family upstairs with the boisterous young children but befriended them all. They are part of the fruit that nurtured this book, too.

Many of the ideas in *The Matter of History* have been refined and sharpened in discussions with other scholars at invited workshops around the world. The members of the interdisciplinary workshops "Ruin Memories" (Falmouth, England) and "Object Matters" (Prague and Vardø, Norway), and most recently "After Discourse" (Oslo), all organized by the Norwegian archaeologist Bjørnar Olsen, have been a wonderful source of insights and ideas. As I was making the final copy edits and proofing the galleys for this book, I was also fortunate to be spending six months as part of Bjørnar's "After Discourse" team at the Center for Advanced Study in Oslo, where the unparalleled support of the staff helped me speed the book to production. First, thanks, of course, to Bjørnar for inviting me to participate in these fascinating projects and for his always perceptive and valuable comments, and also to the other participants, including Caitlin Desilvey, Marek Tamm, Þóra Pétursdóttir, Hein Bjerck, Mats Burström, Saphinaz-Amal Naguib, Elin Andreassen, Svetlana Vinogradova, Kerstin Smeds, Stein Farstadvoll, Ingar Figenschau, and Torgeir Bangstad, among others. Thanks also to the marvelous social anthropologist Luděk Brož of the Prague Academy of Science of the Czech Republic for his invitation to present my work on the creative intelligence of animals to the Ernest Gellner Seminar, which generated many useful comments.

I have found similarly helpful colleagues during my participation at two workshops on the Environmental Post-Humanities, funded by the Swedish Riksbankens Jubileumsfond and organized by the superb scholar of social and technological change Martin Hultman of Linköping University. In addition to Martin himself, my thanks go especially to Owain Jones, Jonathan Metzger, Bjørn Wallsten, and Kristina Lindström, as well as to the dedicated defenders of the fragile beauty of Gotland, Sweden, who shared their extraordinary island home with us in May of 2016.

Frank Uekötter and Corey Ross kindly invited me to join their workshop on "Making Resources Speak" sponsored by the Institute of Advanced Studies at the University of Birmingham, where I was able to try out some of my ideas for a postanthropocentric approach to history. Thanks to Frank for marking my "coming out" as an animal historian and also for the sharp insights of Stefanie Gänger, Hugh Gorman, Sebastian Haumann, Simon Jackson, Hamza Meddeb, and Uwe Lübken.

The members of the "World of Copper" project, sponsored by the British Leverhulme Trust, shared their deep knowledge of the transformative global effects of the red metal at a fascinating workshop

in Santiago, Chile. Many thanks to the project leaders Chris Evans and Olivia Saunders of the University of South Wales for including me and good-humoredly pondering my then still-nascent ideas about the "power of copper."

It is hard to imagine that any workshop could accord better with the questions raised in this book than "Manufacturing Landscapes: Nature and Technology in Environmental History," organized by Helmuth Trischler, Mingfang Xia, and Donald Worster, and cosponsored by Renmin University (Beijing) and the Rachel Carson Center (Munich). This book benefited greatly from the insights and critiques offered by the three organizers, as well as Shen Hou, Agnes Kneitz, Thomas Zeller, Craig Colten, Maurits Ertsen, and Edmund Russell, among others. I also owe the opening discussion of the silk sellers at Beijing's Panjiayuan market in Chapter 5 to this workshop.

The ideas on human niche construction discussed throughout the book, though especially in Chapter 3, were in significant part the product of a workshop on the topic organized by Maurits Ertsen, Edmund Russell, and Christof Mauch, again sponsored by the Rachel Carson Center. My thanks especially to Maurits for first introducing me to this powerful evolutionary approach that accords in many ways with neo-materialist thinking, as well as to the other participants, including Laura Martin, Gregory Cushman, Erle Ellis, Ove Eriksson, David Bello, and Michael Just.

Stefan Berger (Rhur University-Bochum) and Peter Alexander (University of Johannesburg) organized an excellent workshop on "Digging for Treasure: Mining in Global Perspective" held at the Rhur Museum and Zollverein coal mine (now a UNESCO World Heritage site) in Essen, Germany. Both the participants and Stefan Siemer's brilliant exhibit on coal at the Ruhr Museum helped shape my thinking about the material power of minerals.

My discussion of phosphate and phosphorous in Chapter 7 was greatly influenced by my participation in the workshop "Global TraPs" in El-Jadida, Morocco, that was sponsored by Eidgenössische Technische Hochschule in Zürich. My thanks to Roland Scholz for his generous invitation to join his global team and to the employees of Office Chérifien des Phosphates for giving us a rare opportunity to see their massive dredge line at the Khouribga phosphate mine up close and in operation.

Closer to home, I want to thank Thomas Lekan and Robert Emmett for the chance to refine some of my thinking on a new humanism at the

workshop "After Nature: Politics and Practice in Dipesh Chakrabarty's Four Theses of Climate History" sponsored by the University of South Carolina and the Rachel Carson Center. Thanks especially to Dipesh Chakrabarty himself for his critique of my own somewhat abstract critique of modernity, reminding me that, whatever its limits, many around the globe still seek to share in its material benefits. The members of the WEST Network, a consortium of faculty and graduate students interested in environmental history from several western universities, provided feedback on my then still-crystalizing critique of the Anthropocene concept. Thanks especially to Jeremy Vetter, Mark Fiege, Cindy Ott, Ruth Alexander, Paul Sutter, and David Quammen. Finally, while it might at first seem far removed from the topics in this book, my participation in the Aspen Institute's Wye Faculty Seminar in Queenstown, Maryland, provided a wealth of ideas and inspirations – ironically, many of them classically "humanist" – that I am still working through today. The cameo appearances of both Plato and Vaclav Havel in this book are a direct product of the provocative readings and questions provided by our seminar leader, David Townsend.

Montana State University generously provided me with a sabbatical year (2010–11) during which I first began to formulate some of the ideas discussed here, as well as a subsequent Faculty Excellence Grant (2015) that gave me much-needed time to complete the resulting manuscript. Thanks specifically to Nic Rae, the Dean of the College of Letters and Science, who has long supported my work. Several of my colleagues in other departments at MSU generously took the time to read and comment on those parts of the manuscript where I wade into technical subjects outside my own field: thanks to Matt Lavin (Department of Plant Sciences and Plant Pathology), Jack Fisher (Department of Sociology and Anthropology), and Philip Eaton (Department of Physics) for keeping me from drowning in deep waters. My own colleagues in the Department of History and Philosophy have been preternaturally generous in giving me the time and support needed for this book. My thanks especially to Brett Walker, David Cherry, and Susan Cohen, who served as department chairs during the planning and writing of the book. Thanks also to Amanda Hendrix-Komoto for pointing me toward some key works in feminist theory, Catherine Dunlop for her early and enthusiastic support of my ideas, and Margaret Greene for her assistance in interpreting my silk wall hanging from Beijing. A word of special gratitude to Michael Reidy, both for his sharp insights into the history of science and for doing so much to make

the department and university a congenial professional and intellectual home. The superb office staff of the department was also an inexhaustible source of support: Katie Yaw, Cassandra Balent, and Kori Robbins have been brilliant in too many ways to list. Finally, I first tried out many of these ideas during graduate seminars on environmental history and in one-on-one discussions with the department's many talented graduate students. Thanks especially to Robert Gardner, Jerry Jessee, Daniel Zizzamia, Kelsey Matson, Kerri Clement, Reed Knappe, Alexander Aston, Jeffrey Bartos, Jennifer Dunn, Bradley Snow, Cheryl Hendry, Clinton Colgrove, Gary Sims, Patrick Collier, Will Wright, LaTrelle Scherffius, Laurel Angell, and Yu Hirano for their insights and for letting me know when I just wasn't making any sense.

Several colleagues read and commented on all or parts of earlier drafts of this book. Mark Fiege, who I am delighted to now count as a departmental colleague at Montana State University, kindly read the entire manuscript, even though he was right in the midst of uprooting and moving to Montana at the time. Moreover, Mark has been an inexhaustible source of useful ideas and suggestions since the early days of this project, and I am deeply in his debt. As already noted, Brett Walker provided essential feedback on the two chapters dealing most centrally with the Ashio story, helping me to better understand and utilize the Japanese sources. Bjørnar Olsen drew on his immense knowledge of the theoretical literature to provide highly detailed comments that greatly improved Chapters 2 and 3. Lisa Onaga read my chapter on silkworms and helped me to better understand the complex nature of silkworm breeding and hybridization. Thanks to Ian Miller for his reading of the chapter on copper and also for allowing me to draw on parts of his work-in-progress on the electrification of Tokyo. Though she is of course a bit more than just a colleague, my wife Cherí was one of my first and most perceptive readers, subjecting the entire book to her exacting standards of clarity and her eagle-eyed ability to spot errors and less-than-felicitous phrasings. Finally, my thanks to the anonymous reviewers for Cambridge University Press who offered many useful suggestions that improved the final product.

At Cambridge University Press, thanks first to John McNeill and Edmund Russell, the coeditors of the series Studies in Environment and History, for their enthusiastic responses to my early proposal to write a book bringing environmental history into dialogue with the new materialism. John has long argued for and demonstrated the importance of material factors in his own work, providing a scholarly model I have

tried to emulate. I have been greatly influenced by Ed's ideas for many years, and his concepts of coevolutionary history and the technology of animals are central to this book. It is difficult for me to imagine two editors whose work I admire more and whose series could provide a more suitable home for *The Matter of History*. Many thanks as well to the Senior Editor in history at Cambridge, Deborah Gershenowitz, for her vital support and assistance, and to Kristina Deusch (Editorial Assistant), Allan Alphonse (Project Manager), and Matt Sweeney (Content Manager) for their help in shepherding this book through the production process.

Lisa Sederis generously shared her research and ideas on the troublingly transcendent concept of the noösphere discussed in Chapter 7. Mark Stoll provided much-needed advice on the history of Christian theological ideas about nature and the environment. At the Grant-Kohrs Ranch National Historic Site in Montana, Chance Reynolds treated me to a brilliant tour of the Conrad Kohrs home and ranch, greatly deepening my sense of the place and its material dynamic. Chance also took time out of his busy schedule to chase down several leads, including the history of the mounted longhorns in the Kohrs home. Kyle Tusler generously shared his research on the brutal Montana winter of 1886–87 discussed in Chapter 4. Bruce Whittenberg, Jennifer Bottomly-O'Looney, and Kendra Newhall at the Montana Historical Society tracked down the history of Charlie Russell's "Waiting for a Chinook" and helped me gain permission to reprint it here. Equally helpful was Hiromi Myo of Hakodate City Central Library in Japan whose efforts made it possible to publish Kakizaki Hakyō's dynamic painting of the Ainu chief Ikotoi sporting a silk robe.

Though they will never read it, thanks are nonetheless due to the many nonhuman organisms and things whose intelligence, creativity, and always-surprising powers have so profoundly shaped human history. Thanks go especially to the Texas Longhorns, mulberry silkworms, and copper metal that are the true stars of this book and that have most certainly taught me to think in new ways.

A few sections of the book have been published in different forms, and I am grateful to several editors for their permission to reuse this material. Parts of Chapter 4 appear in "Copper and Longhorns: Material and Human Power in Montana's Smelter Smoke War, 1860–1910," in John McNeill and George Vrtis, eds., *Mining North American, 1522–2012: An Environmental History* (Berkeley: University of California Press, forthcoming 2017). Some of my discussion of the spatial powers of copper in Chapter 6 was first published in "The Persistence of Things: Copper and the Evolution of Space in Modernist America and Japan,"

a special issue on the theme of "Rohstoffräume/Sites of Resource Extraction," in *Jahrbuch für Wirtschaftsgeschichte* (*Yearbook for Economic History*), 57 (2016): 169–86. My thanks to the editors of De Gruyter Oldenbourg in Berlin, as well as to the special issue editors Nora Thorade and Sebastian Haumann, who invited me to contribute and provided valuable feedback on early drafts of the article. Finally, parts of my critique of the Anthropocene term and concept first appeared as, "Against the Anthropocene: A Neo-materialist Perspective," *History, Culture, and Modernity* 3 (2015): 1–28. Thanks to Corey Ross for asking me to contribute to the journal's special issue on neo-materialism.

My final and most heartfelt thanks go as always to my family. When I was a boy, my mother gave me leave to explore wherever my wide-ranging interests led, asking only that I always read, whether it be comic books or finer fair. I did so voraciously and with enduring consequences. To the degree I have become something of a scientific storyteller, I credit my father, who, on our many family camp outs under the Montana Big Sky, would take us away from the fire to see the stars and relate the mysteries of astronomy and relativity. He is our family Carl Sagan. Even by the measure of delayed adulthood that has become more common today, I still required an embarrassingly long time to grow up. But I hope there is at least some reason to believe that all those years of "exploration" eventually paid off. Their patient support was inexhaustible, as was that of my four brothers – a number sadly now reduced to three.

One of the harder realities of life is that there are far too many worthwhile things to do than the brief time allotted permits. I have always tried to prioritize what is most precious, and for more than a decade now this has unquestionably been my wife Cherí and our children Carina and Daniel. I fear there were still too many times when this book kept me from a sledding excursion or a science fair project, or too many moments of absent distraction, even when I was physically there. But if practice was imperfect, please know that there was never any question that you have and always will be the best justification for my imperfect existence. Whether my many absences are ultimately justified by the results, I leave for you to judge. I can only say that I have tried my best to write a book that you might consider worthy of the time together lost. I hope you do.