

Cambridge University Press

978-0-521-87164-8 - Climate Change and the Course of Global History: A Rough Journey

John L. Brooke

Frontmatter

[More information](#)

Climate Change and the Course of Global History

Climate Change and the Course of Global History: A Rough Journey presents the first global study by a historian to fully integrate the earth-system approach of the new climate science with the material history of humanity. Part I argues that geological, environmental, and climatic history explain the pattern and pace of biological and human evolution. Part II explores the environmental circumstances of the rise of agriculture and the state in the Early and Mid-Holocene, and presents an analysis of human health from the Paleolithic through the rise of the state, including the Neolithic Demographic Transition. Part III introduces the problem of economic growth and examines the human condition in the Late Holocene from the Bronze Age through the Black Death, assessing the relationships among human technologies, climatic change, and epidemic disease. Part IV explores the move to modernity, stressing the emerging role of human economic and energy systems as earth-system agents in the Anthropocene. Supported by climatic, demographic, and economic data with forty-nine figures and tables custom made for this book, *Climate Change and the Course of Global History* provides a path-breaking model for historians of the environment, the world, and science, among many others.

John L. Brooke is Humanities Distinguished Professor of History at Ohio State University, where he also directs the Center for Historical Research. His books include *Columbia Rising: Civil Life on the Upper Hudson from the Revolution to the Age of Jackson* (2010), which won the Best Book Prize from the Society of the Historians of the Early American Republic; *The Heart of the Commonwealth: Society and Political Culture in Worcester County Massachusetts, 1713–1861* (Cambridge, 1994), which won the Merle Curti Award for Intellectual History from the Organization of American Historians; and *The Refiner's Fire: The Making of Mormon Cosmology, 1644–1844* (Cambridge, 1989), which won the Bancroft Prize for American History. He has held fellowships from the Guggenheim Foundation, the National Endowment for the Humanities, the American Council of Learned Societies, the American Antiquarian Society, and the Harvard Charles Warren Center.

Cambridge University Press

978-0-521-87164-8 - Climate Change and the Course of Global History: A Rough Journey

John L. Brooke

Frontmatter

[More information](#)

Cambridge University Press

978-0-521-87164-8 - Climate Change and the Course of Global History: A Rough Journey

John L. Brooke

Frontmatter

[More information](#)**Studies in Environment and History**

Editors

J. R. McNeill, *Georgetown University*
Edmund P. Russell, *University of Kansas*

Editors Emeritus

Alfred W. Crosby, *University of Texas at Austin*
Donald Worster, *University of Kansas*

Other Books in the Series

- Emmanuel Kreike *Environmental Infrastructure in African History: Examining the Myth of Natural Resource Management*
- Kenneth F. Kiple *The Caribbean Slave: A Biological History*
- Alfred W. Crosby *Ecological Imperialism: The Biological Expansion of Europe, 900–1900, second edition*
- Arthur F. McEvoy *The Fisherman's Problem: Ecology and Law in the California Fisheries, 1850–1980*
- Robert Harms *Games against Nature: An Eco-Cultural History of the Nunu of Equatorial Africa*
- Warren Dean *Brazil and the Struggle for Rubber: A Study in Environmental History*
- Samuel P. Hays *Beauty, Health, and Permanence: Environmental Politics in the United States, 1955–1985*
- Donald Worster *The Ends of the Earth: Perspectives on Modern Environmental History*
- Michael Williams *Americans and Their Forests: A Historical Geography*
- Timothy Silver *A New Face on the Countryside: Indians, Colonists, and Slaves in the South Atlantic Forests, 1500–1800*
- Theodore Steinberg *Nature Incorporated: Industrialization and the Waters of New England*
- J. R. McNeill *The Mountains of the Mediterranean World: An Environmental History*
- Elinor G. K. Melville *A Plague of Sheep: Environmental Consequences of the Conquest of Mexico*
- Richard H. Grove *Green Imperialism: Colonial Expansion, Tropical Island Edens and the Origins of Environmentalism, 1600–1860*
- Mark Elvin and Tsui'jung Liu *Sediments of Time: Environment and Society in Chinese History*
- Robert B. Marks *Tigers, Rice, and Silt: Environment and Economy in Late Imperial South China*

Cambridge University Press

978-0-521-87164-8 - Climate Change and the Course of Global History: A Rough Journey

John L. Brooke

Frontmatter

[More information](#)

- Thomas Dunlap *Nature and the English Diaspora*
- Andrew Isenberg *The Destruction of the Bison: An Environmental History*
- Edmund Russell *War and Nature: Fighting Humans and Insects with Chemicals from World War I to Silent Spring*
- Judith Shapiro *Mao's War against Nature: Politics and the Environment in Revolutionary China*
- Adam Rome *The Bulldozer in the Countryside: Suburban Sprawl and the Rise of American Environmentalism*
- Nancy J. Jacobs *Environment, Power, and Injustice: A South African History*
- Matthew D. Evenden *Fish versus Power: An Environmental History of the Fraser River*
- Myrna I. Santiago *The Ecology of Oil: Environment, Labor, and the Mexican Revolution, 1900–1938*
- Frank Uekoetter *The Green and the Brown: A History of Conservation in Nazi Germany*
- James L. A. Webb, Jr. *Humanity's Burden: A Global History of Malaria*
- Richard W. Judd *The Untilled Garden: Natural History and the Spirit of Conservation in America, 1740–1840*
- Edmund Russell *Evolutionary History: Uniting History and Biology to Understand Life on Earth*
- Alan Mikhail *Nature and Empire in Ottoman Egypt: An Environmental History*
- Sam White *Climate of Rebellion in the Early Modern Ottoman Empire*
- Gregory T. Cushman *Guano and the Opening of the Pacific World: A Global Ecological History*
- Donald Worster *Nature's Economy: A History of Ecological Ideas, second edition*

Cambridge University Press

978-0-521-87164-8 - Climate Change and the Course of Global History: A Rough Journey

John L. Brooke

Frontmatter

[More information](#)

Climate Change and the Course of Global History

A Rough Journey

JOHN L. BROOKE

Ohio State University



CAMBRIDGE
UNIVERSITY PRESS

Cambridge University Press
 978-0-521-87164-8 - Climate Change and the Course of Global History: A Rough Journey
 John L. Brooke
 Frontmatter
[More information](#)

CAMBRIDGE UNIVERSITY PRESS

32 Avenue of the Americas, New York NY 10013-2473, USA

Cambridge University Press is part of the University of Cambridge.

It furthers the University's mission by disseminating knowledge in the pursuit of education, learning, and research at the highest international levels of excellence.

www.cambridge.org

Information on this title: www.cambridge.org/9780521692182

© John L. Brooke 2014

This publication is in copyright. Subject to statutory exception and to the provisions of relevant collective licensing agreements, no reproduction of any part may take place without the written permission of Cambridge University Press.

First published 2014

Printed in the United States of America

A catalog record for this publication is available from the British Library.

Library of Congress Cataloging in Publication data

Brooke, John L., 1953–

Climate change and the course of global history / John Brooke.
 pages cm. – (Studies in environment and history)

Includes bibliographical references and index.

ISBN 978-0-521-87164-8 (hardback) – ISBN 978-0-521-69218-2 (paperback)

1. Climatic changes – History. 2. Nature – Effect of human beings on. 3. Human beings – Effect of climate on. 4. World history. I. Title.

QC903.B76 2014

304.2'709-dc23 2013036435

ISBN 978-0-521-87164-8 Hardback

ISBN 978-0-521-69218-2 Paperback

Cambridge University Press has no responsibility for the persistence or accuracy of URLs for external or third-party Internet Web sites referred to in this publication and does not guarantee that any content on such Web sites is, or will remain, accurate or appropriate.

Cambridge University Press

978-0-521-87164-8 - Climate Change and the Course of Global History: A Rough Journey

John L. Brooke

Frontmatter

[More information](#)

For Sara, Matt, and Benjy, and our collective future.

Cambridge University Press

978-0-521-87164-8 - Climate Change and the Course of Global History: A Rough Journey

John L. Brooke

Frontmatter

[More information](#)

Contents

<i>List of Figures and Tables</i>	page	xiii
<i>Acknowledgments</i>		xv
<i>List of Abbreviations</i>		xix
Introduction: Growth, Punctuation, and Human Well-Being		1
PART I EVOLUTION AND EARTH SYSTEMS		15
1 Geological Time: The Court Jester on the Platform of Life		25
<i>Tectonics, Asteroids, Plumes, Punctuation, Gaia: Revolutions in Earth Science</i>		26
<i>Evolution: From Neo-Darwinism to Complex Emergence</i>		29
<i>A Punctuated Earth Systems Synthesis</i>		36
<i>Origins: The Hadean and the Archean</i>		37
<i>The Archean/Paleo-Proterozoic Crisis</i>		38
<i>The Neoproterozoic Crisis and the Cambrian: A Snowball Earth?</i>		42
<i>Phanerozoic Super-Cycles – and Biotic Extinctions and Escalations</i>		44
<i>Mass Extinctions</i>		49
2 Human Emergence		55
<i>Into the Cenozoic Icehouse</i>		56
<i>The Court Jester in the Cenozoic: Debate and Three Kinds of Evidence</i>		58
<i>Miocene Apes and the Early Hominins</i>		62
<i>Orbital Cycles: From the 23K World to the 41K World</i>		66
<i>The 41K World and the Genus Homo</i>		70
<i>The 100K World: Homo Heidelbergensis, Archaic Homo Sapiens</i>		77
<i>Modern Humans in the 100K World</i>		83
<i>The Modern Origins Debate and a Renewed Understanding of Mortality</i>		97

	<i>Gould and Eldridge's Punctuation Meets Boserup's Intensification: Toward a New Understanding of the Upper Paleolithic</i>	104
	PART II DOMESTICATION, AGRICULTURE, AND THE RISE OF THE STATE	109
3	Agricultural Revolutions	121
	<i>Energy</i>	123
	<i>Changing Climates: The End of the Pleistocene</i>	130
	<i>New Climate Science, New Archaeological Science</i>	134
	<i>Human Adaptation at the Bolling-Allerød Warming: The Mesolithic</i>	136
	<i>The Younger Dryas and the Early Holocene: Cereal Domestication in the Northern Mid-Latitudes</i>	144
	<i>Early Holocene Warming and Tropical Domestications Into the Mid-Holocene: Final Domestications and First Dispersals</i>	154
4	The Mid-Holocene, the Late Neolithic, and the Urban-State Revolution	165
	<i>The Emergence of Modern Global Climates: The Mid-Holocene Transition</i>	166
	<i>The Mid-Holocene Crisis and the Rise of the State</i>	183
	<i>Neolithic Intensification: The Secondary Products Revolution</i>	191
	<i>China and Mesopotamia in the Neolithic–Bronze Age Transition</i>	194
5	Human Well-Being from the Paleolithic to the Rise of the State	213
	<i>Human Health in the Paleolithic</i>	213
	<i>The Neolithic Demographic Transition</i>	216
	<i>Civilizational Stresses in the Neolithic</i>	220
	<i>Fertility and Mortality in the Neolithic</i>	225
	<i>Fertility, Mortality, and the Origins of Complex Societies: The Case of Southwest Asia</i>	229
	PART III ANCIENT AND MEDIEVAL AGRARIAN SOCIETIES	243
6	Stasis and Growth in the Epoch of Agrarian Empires	261
	<i>Getting Ahead, Running in Place, Falling Behind</i>	261
	<i>Population Growth and Dark Ages</i>	269
	<i>Endogenous Degradations?</i>	272
	<i>Late Holocene Climate Reversals</i>	276
	<i>Disease and Epidemics</i>	279
	<i>Energy: Innovation, Labor, and Slavery</i>	281
	<i>Punctuations</i>	285

<i>Contents</i>		xi
7	Optimum and Crisis in Early Civilizations, 3000–500 BC	288
	<i>The Old World Bronze Age: Expansions and Crises,</i>	
	3000–1000 BC	288
	<i>The Preclassical Crisis and the Age of Iron, 1200–300 BC</i>	300
	<i>A Global View on Optimum and Crisis</i>	306
	<i>Human Health in the Bronze Age Optimum and the Iron</i>	
	Age/Preclassical Crisis	312
8	A Global Antiquity, 500 BC–AD 542	317
	<i>The Problem of Growth in Antiquity</i>	317
	<i>China, Iron, and Rotary Power</i>	318
	<i>Global Antiquity: Numbers and Climate</i>	322
	<i>The Rise of Rome</i>	328
	<i>The Fall of Rome?</i>	339
9	The Global Dark and Middle Ages, AD 542–1350	350
	<i>Climate Reversals in the Tropics and the North</i>	351
	The Dark Ages, AD 400–900	351
	The Medieval Climate Anomaly, AD 900–1275	358
	<i>Population and Health in the Old World Dark and Middle Ages</i>	360
	<i>Growth and Crisis in the Medieval World, 1000–1350</i>	362
	Southern Asia	363
	North America	364
	China and Mongolia	367
	Into the Little Ice Age	370
	Europe	372
	<i>The Little Ice Age and the Black Death</i>	380
PART IV INTO THE MODERN CONDITION		393
10	Climate, Demography, Economy, and Polity in the Late Medieval–Early Modern World, 1350–1700	413
	<i>Population in and beyond the Third Age of Epidemics, 1300–1800</i>	414
	<i>The Question of Growth and Divergence</i>	417
	<i>The Aftermath of the Third Age of Epidemics</i>	423
	<i>Emerging European Empires, New World Depopulation</i>	429
	<i>The Little Ice Age, New World Depopulation, and the Origins of the African Slave Trade</i>	438
	<i>The Little Ice Age and Early Modern Eurasia</i>	444
	<i>Early Modern England in the Age of Empire, the Little Ice Age, and the Seventeenth-Century Crisis</i>	451
	<i>The Seventeenth-Century English Energy Revolution</i>	459
11	Global Transformations: Atlantic Origins, 1700–1870	467
	<i>The End of the Little Ice Age and the Beginning of Modern Population Growth, 1700–1860s</i>	468

Cambridge University Press

978-0-521-87164-8 - Climate Change and the Course of Global History: A Rough Journey

John L. Brooke

Frontmatter

[More information](#)

xii

Contents

	<i>The Beginnings of the Modern Anthropocene</i>	476
	<i>Industrial Revolutions</i>	479
	<i>The First Industrial Revolution</i>	483
	<i>Emissions and Atmosphere, 1800–1880</i>	495
12	Launching Modern Growth: 1870 to 1945	500
	<i>Urbanization, a New Political Economy, and the Second Industrial Revolution</i>	500
	<i>Atlantic Cities and the First Wave: Environmental Crisis and Social Reform</i>	502
	<i>The Second Industrial Revolution</i>	509
	<i>The Demographic Revolution, 1800–1945</i>	513
	<i>1914–1945: A World in Crisis, Growth on Hold</i>	518
	<i>Environmental Impacts, 1870–1945: The Second Wave</i>	524
13	Growth beyond Limits: 1945 to Present	529
	<i>The Demographic Revolution, Part II: 1945 to Present</i>	530
	<i>The Age of High Growth and a Third Industrial Revolution? The World Economy, 1945 to Present</i>	534
	<i>Environmental Impacts, 1945 to Present: Confronting the Third Wave</i>	543
	<i>The Modern Anthropocene</i>	553
	Coda: A Rough Journey into an Uncertain Future	559
	<i>Malthus Vindicated?</i>	560
	<i>Deniers, Pessimists, and Pragmatists</i>	570
	<i>Data Bibliography: Full Citations for Data Used in Figures and Tables</i>	581
	<i>Index</i>	593

Cambridge University Press

978-0-521-87164-8 - Climate Change and the Course of Global History: A Rough Journey

John L. Brooke

Frontmatter

[More information](#)

Figures and Tables

Part I	Evolution and Earth Systems	<i>page</i> 17
Part II	Domestication, Agriculture, and the Rise of the State	111
Part III	Ancient and Medieval Agrarian Societies	245
Part IV	Into the Modern Condition	395

The climate series in all of the figures have been displayed so that warmer and wetter conditions move up the charted figures, and colder and drier conditions down. Unless otherwise indicated, all figures are by the author.

Cambridge University Press

978-0-521-87164-8 - Climate Change and the Course of Global History: A Rough Journey

John L. Brooke

Frontmatter

[More information](#)

Acknowledgments

This has been a project long in the making, running back to my undergraduate days at Cornell, and to various travels far and wide in the 1960s and 1970s. I want to thank my parents for the example of their adventuring spirit, and my undergraduate mentors at Cornell, particularly Robert Ascher, Stephen Kaplan, and the late Thomas Lynch, for their careful instruction and sage advice. After I had served for many years as an early American historian, the Tufts Environmental Studies Program got me to think again about a global perspective, and with its support in 1993 I began to teach global environmental history. A legion of undergraduates at Tufts and Ohio State have helped me think through ways to describe the long structures of the past, and I thank them for their patience and their enduring interest, and for their feedback on this manuscript as it has evolved.

I have presented chapters and general arguments around Ohio State at the Geology Sustainability Forum, the Environmental Science Graduate Program Seminar, the Global Human Health Pre-Conference, the Early Modern Seminar, the Department of History Seminar, the Byrd Polar Center Lecture Series, and elsewhere, at the University of Binghamton History Lecture Series, the University of Pennsylvania Annenberg Seminar, the University of Pittsburgh Department of Geology Speakers Series, and the American Historical Association. Thanks to all of the participants in these events who helped me sharpen and clarify my thinking.

Frank Smith listened patiently to my emerging thinking about this project for many years and carried his advocacy to higher powers at Cambridge University Press; when Frank left Cambridge, Eric Crahan lent his enthusiastic support. After Eric's departure, Deborah Gershenowitz carried this project forward with wonderful energy. After casting their sharp eyes over the entire manuscript, Donald Worster and J. R. McNeill asked me to submit to their Cambridge series "Studies in Environment and History"; I am deeply indebted to them for their encouragement and careful commentary.

Since 2005 when I started writing this book I have incurred a host of debts to colleagues near and far who have listened to my developing ideas, read innumerable chapter manuscripts, corresponded from a distance, and sent me their hard-won data. Among those who have read my manuscripts, I want to remember especially Andrew Sherratt and William Burroughs, both of whom have passed on – I hope that my efforts warrant their early support. Renée Hetherington and David Porinchu also read important parts of the manuscript for the Press, and I hope that I have done justice to their comments. Colleagues at Ohio State, Tufts, and literally around the world have provided invaluable readings, commentary, and guidance. I want to thank especially Bruce Batten, Manse Blackford, James Boone, Nick Breyfogle, Phil Brown, Bruce Campbell, Bill Childs, Barbara Hanawalt, Dan Hobbins, David Hoffman, Clark Larsen, Steve Marrone, Joy McCorriston, Chris Otter, Geoffrey Parker, Chris Reed, Jerry Rose, Nate Rosenstein, Randy Roth, Rick Steckel, the late Philip Walker, and Ying Zhang. Mark Stickle, Tim Leech, and J. R. McNeill's 2012 graduate seminar students all gave the manuscript useful readings. John Casterline and Greg Ginet provided invaluable assistance with higher math – compound growth rates and low-pass filters – at critical moments. Once again, Jim DeGrand has produced some wonderful charts and maps. Taotao Qian and David Decker helped me stumble through the challenges of building figures in IDL. Jayashree Prabhu and Ami Naramor have handled an arduous copyediting process in fine style, and Susan Cohen has produced another excellent index.

A host of climate scientists, historians, and archaeologists around the world have taken time out of their busy lives to correspond with me and send me their data: Andy Baker, Anthony Barnosky, Broxton Bird, Jean-Pierre Bocquet-Appel, Kimberley Bowes, Keith Briffa, Françoise Chalié, Fahu Chen, Hai Cheng, Francesco Cinnerella, Edward Cook, Basil Davis, Peter deMonocal, Sharon DeWitte, Carolyn Dykoski, Dominic Fleitman, Nicholas Graham, Anil Gupta, Gerald Haug, Israel Hershkovitz, Ulrike Herzschuh, Jonathan Holmes, Yetang Hong, Junfeng Ji, Willem Jongman, Mohammad Aslam Khan Khalil, Andrei Kurbatov, Matthew Lachniet, Michael Marshall, Mira Bar-Matthews, Vincent McCaulay, Ian McDougall, John Meadows, Christopher Moy, Raimund Muscheler, Jack Ridge, Charlotte Roberts, Eelco Rohling, James Russell, Frank Sirocko, Stephen J. Smith, Friedhelm Steinhilber, F. A. Street-Perrott, Faisal Saeed Syed, Liangcheng Tan, Ellen Mosley Thompson, Lucia Wick, Yongtao Yu, and Gregory Zelinsky. This list cannot do justice to their efforts, and they should take much of the credit for what I have gotten right, and none of the blame for what I have gotten wrong!! Greg Ginet was there from the beginning, conducting a mini-seminar with me all during the 1990s, crossing Mount Vernon Street every few months with armloads of well-read copies of *Scientific American* and *Science News*, and generally training me in the culture of the modern sciences.

Cambridge University Press

978-0-521-87164-8 - Climate Change and the Course of Global History: A Rough Journey

John L. Brooke

Frontmatter

[More information](#)*Acknowledgments*

xvii

I obviously owe a huge debt to these and many other scholars in climate science, geology, and archaeology who have gone into the field to record and then analyze and publish the mute history of the earth and humanity. Their work represents a vast treasure house of information from the sediments of time that comprises the material archive of earth history. Unfortunately I cannot cite their work adequately. Following standard practice in the historical discipline, I follow the Chicago style. For reasons of space, I restrict my footnote citations to a maximum of two authors; works produced by larger teams are cited to the lead author et al. This concession to space does not allow me to give full credit to the arduous work of a host of researchers. The bibliography lists the entire authorship of those articles from which data is used in the figures.

Sara, Matt, Benjy, and an array of old friends have patiently watched with some interest, when they were not busy with other things, as I have slowly constructed this volume. Sara, for a third of a century my love and anchor to windward, lives a life of environmental balance that often puts me to shame. Benjy at a very early age popped his head up from his drawing to articulate a simple truth – people should live their lives without disturbing the natural world. Matt started fighting the fight in the early 1990s, writing an editorial on solar power for the local paper, and – at the age of nine – conducting a heated argument with a dear but misguided relation on the validity of the science of climate change on his way to swimming at Goose Pond. May this book contribute to more such arguments, and move some minds.

Cambridge University Press

978-0-521-87164-8 - Climate Change and the Course of Global History: A Rough Journey

John L. Brooke

Frontmatter

[More information](#)

Abbreviations

Abbreviations in Texts and Figures

BY	billions of years before present
ENSO	El Niño/Southern Oscillation
K-T boundary	Cretaceous-Tertiary boundary
LBK	Linear-Band-Keramik
LIA	Little Ice Age
MCA	Medieval Climate Anomaly
MIS	Marine Isotope Stage
MSA	African Middle Stone Age
MY	millions of years before present
NAO	North Atlantic Oscillation
PPN	PrePottery Neolithic
ybp	years before present
yma	moving average in years

Abbreviations for Most Frequent Citations

<i>AER</i>	<i>American Economic Review</i>
<i>AHR</i>	<i>American Historical Review</i>
<i>AJHG</i>	<i>American Journal of Human Genetics</i>
<i>AJPA</i>	<i>American Journal of Physical Anthropology</i>
<i>AmAnth</i>	<i>American Anthropologist</i>
<i>AmAntiq</i>	<i>American Antiquity</i>
<i>ARA</i>	<i>Annual Review of Anthropology</i>
<i>CA</i>	<i>Current Anthropology</i>
<i>CArchJ</i>	<i>Cambridge Archaeological Journal</i>
<i>Climate Change 2007: The Physical Science Basis</i>	Susan Solomon et al., eds., <i>Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change</i> (Cambridge and New York, 2007).

<i>ClimCh</i>	<i>Climatic Change</i>
<i>ClimDyn</i>	<i>Climate Dynamics</i>
<i>EcolEcon</i>	<i>Ecological Economics</i>
<i>EconHR</i>	<i>Economic History Review</i>
<i>EmInfDis</i>	<i>Emerging Infectious Diseases</i>
<i>EnvSciTech</i>	<i>Environmental Science and Technology</i>
<i>EPSL</i>	<i>Earth and Planetary Science Letters</i>
<i>EREconH</i>	<i>European Review of Economic History</i>
<i>ExpEconH</i>	<i>Explorations in Economic History</i>
<i>GBC</i>	<i>Global Biogeochemical Cycles</i>
<i>GEC</i>	<i>Global Environmental Change</i>
<i>GPC</i>	<i>Global and Planetary Change</i>
<i>GRL</i>	<i>Geophysical Research Letters</i>
<i>HumEcol</i>	<i>Human Ecology</i>
<i>IJC</i>	<i>International Journal of Climatology</i>
<i>JAfrH</i>	<i>Journal of African History</i>
<i>JAmH</i>	<i>Journal of American History</i>
<i>JAnthArch</i>	<i>Journal of Anthropological Archaeology</i>
<i>JAnthRes</i>	<i>Journal of Anthropological Research</i>
<i>JArchRes</i>	<i>Journal of Archaeological Research</i>
<i>JArchS</i>	<i>Journal of Archaeological Science</i>
<i>JClim</i>	<i>Journal of Climate</i>
<i>JEArch</i>	<i>Journal of European Archaeology</i>
<i>JEconH</i>	<i>Journal of Economic History</i>
<i>JEconL</i>	<i>Journal of Economic Literature</i>
<i>JEconP</i>	<i>Journal of Economic Perspectives</i>
<i>JEEcH</i>	<i>Journal of European Economic History</i>
<i>JFdArch</i>	<i>Journal of Field Archaeology</i>
<i>JGeol</i>	<i>Journal of Geology</i>
<i>JGR</i>	<i>Journal of Geophysical Research</i>
<i>JHumEv</i>	<i>Journal of Human Evolution</i>
<i>JIH</i>	<i>Journal of Interdisciplinary History</i>
<i>JQS</i>	<i>Journal of Quaternary Science</i>
<i>JRA</i>	<i>Journal of Roman Archaeology</i>
<i>JRS</i>	<i>Journal of Roman Studies</i>
<i>JWH</i>	<i>Journal of World History</i>
<i>JWP</i>	<i>Journal of World Prehistory</i>
<i>MBE</i>	<i>Molecular Biology and Evolution</i>
<i>MedHyp</i>	<i>Medical Hypotheses</i>
<i>NatGen</i>	<i>Nature Genetics</i>
<i>NatGeosc</i>	<i>Nature Geoscience</i>
<i>NYT</i>	<i>New York Times</i>
<i>P&P</i>	<i>Past and Present</i>
<i>PBSRom</i>	<i>Papers of the British School at Rome</i>

Cambridge University Press

978-0-521-87164-8 - Climate Change and the Course of Global History: A Rough Journey

John L. Brooke

Frontmatter

[More information](#)*Abbreviations*

xxi

<i>PNAS</i>	<i>Proceedings of the National Academy of Sciences</i>
<i>PopDevR</i>	<i>Population and Development Review</i>
<i>PopSt</i>	<i>Population Studies</i>
<i>PPP</i>	<i>Palaeogeography, Palaeoclimatology, Palaeoecology</i>
<i>PTRS, LB</i>	<i>Philosophical Transactions of the Royal Society, London B</i>
<i>QSR</i>	<i>Quaternary Science Reviews</i>
<i>QuatInt</i>	<i>Quaternary International</i>
<i>QuatRes</i>	<i>Quaternary Research</i>
<i>SA</i>	<i>Scientific American</i>
<i>SedGeol</i>	<i>Sedimentary Geology</i>
<i>VHAb</i>	<i>Vegetation History and Archaeobotany</i>
<i>WdArch</i>	<i>World Archaeology</i>
<i>WMQ</i>	<i>William and Mary Quarterly</i>
<i>YPA</i>	<i>Yearbook of Physical Anthropology</i>