



"The most original . . . history book I have read this year."  
—Eric Hobsbawm



An Environmental History of the  
Twentieth-Century World | J. R. McNeill

something new under the sun





# **ALSO BY J. R. MCNEILL**

---

THE MOUNTAINS OF THE MEDITERRANEAN WORLD: AN ENVIRONMENTAL HISTORY

THE ATLANTIC EMPIRES OF FRANCE AND SPAIN

ATLANTIC AMERICAN SOCIETIES FROM COLUMBUS THROUGH ABOLITION (*coeditor*)



**SOMETHING NEW**

---

**UNDER THE SUN**



**SOMETHING NEW**  

---

**UNDER THE SUN**

**AN ENVIRONMENTAL HISTORY OF  
THE TWENTIETH-CENTURY WORLD**

**J. R. McNEILL**

**W. W. NORTON & COMPANY • NEW YORK • LONDON**





All rights reserved

For information about permission to reproduce selections from this book, write to Permissions, W. W. Norton & Company, Inc., 500 Fifth Avenue, New York, NY 10110

Library of Congress Cataloging-in-Publication Data

McNeill, J. R.

Something new under the sun: an environmental history of the twentieth-century world / J. R. McNeill.

p. cm.

Includes bibliographical references.

**ISBN:** 978-0-393-07589-2

1. Human ecology—History—20th century. 2. Nature—Effect of human beings on—History—20th century. I. Title.

GF13.M39 2000

304.2'8'0904—dc21

99-054900

W. W. Norton & Company, Inc., 500 Fifth Avenue,  
New York, N.Y. 10110

[www.wwnorton.com](http://www.wwnorton.com)

W. W. Norton & Company Ltd., 10 Coptic Street,  
London WC1A 1PU







[List of Maps and Tables](#)

[Foreword by Paul Kennedy](#)

[Acknowledgements](#)

[Preface](#)

## [1. Prologue: Peculiarities of a Prodigal Century](#)

[ECONOMIC GROWTH SINCE 1500](#)

[POPULATION GROWTH SINCE 10,000 B.C.](#)

[ENERGY HISTORY SINCE 10,000 B.C.](#)

[CONCLUSION](#)

## [PART ONE: THE MUSIC OF THE SPHERES](#)

## [2. The Lithosphere and Pedosphere: The Crust of the Earth](#)

[THE BASICS OF THE EARTH'S CRUST](#)

[SOIL ALCHEMY](#)

[SOIL POLLUTION](#)

[EARTH MOVERS](#)

[CONCLUSION](#)

## [3. The Atmosphere: Urban History](#)

[THE BASICS OF THE ATMOSPHERE](#)

[AIR POLLUTION BEFORE 1900](#)

[AIR POLLUTION SINCE 1900](#)

[COAL CITIES](#)

[SMOG CITIES](#)

[MEGACITIES](#)

[RECOVERING CITIES](#)

[CONCLUSION](#)

## **4. The Atmosphere: Regional and Global History**

[REGIONAL AIR POLLUTION SINCE 1870](#)

[THE AIR IN JAPAN](#)

[ACID RAIN](#)

[FURTHER CONSEQUENCES OF AIR POLLUTION](#)

[CLIMATE CHANGE AND STRATOSPHERIC OZONE](#)

[SPACE POLLUTION](#)

[CONCLUSION](#)

## **5. The Hydrosphere: The History of Water Use and Water Pollution**

[WATER BASICS](#)

[WORLD WATER USE AND SUPPLY](#)

[URBAN WATER](#)

[RIVER WATER](#)

[LAKES AND EUTROPHICATION](#)

[SEAS AND OCEANS](#)

[CONCLUSION](#)

## **6. The Hydrosphere: Depletions, Dams, and Diversions**

[GROUNDWATER](#)

[DAMS AND DIVERSIONS](#)

[TAMING FLOODS AND DRAINING WETLANDS](#)

[COASTLINES](#)

[CONCLUSION](#)

## **7. The Biosphere: Eat and Be Eaten**

[MICROBIOTA: THE FIRST LORDS OF THE BIOSPHERE](#)

[LAND USE AND AGRICULTURE](#)

[CONCLUSION](#)

## **8. The Biosphere: Forests, Fish, and Invasions**

[FORESTS](#)

WHALING AND FISHING

BIOLOGICAL INVASIONS

---

BIODIVERSITY AND THE SIXTH EXTINCTION

CONCLUSION

## **PART TWO: ENGINES OF CHANGE**

### **9. More People, Bigger Cities**

POPULATION GROWTH

MIGRATION

THE FOOTPRINTS AND METABOLISMS OF CITIES

CONCLUSION

### **10. Fuels, Tools, and Economics**

ENERGY REGIMES AND THE ENVIRONMENT

TECHNOLOGICAL CHANGE AND THE ENVIRONMENT

ECONOMIC CHANGES AND THE ENVIRONMENT

CONCLUSION

### **11. Ideas and Politics**

BIG IDEAS

ENVIRONMENTAL IDEAS

INTERNATIONAL POLITICS AND WAR

ENVIRONMENTAL POLITICS AND POLICIES

CONCLUSION

### **12. Epilogue: So What?**

BIBLIOGRAPHY

CREDITS





# List of Maps and Tables

---

## MAPS

- [1. KEY LOCATIONS IN MINING AND SOIL EROSION HISTORY](#)
- [2. KEY CITIES AND SMELTER SITES IN MODERN AIR POLLUTION HISTORY](#)
- [3. REGIONAL AIR POLLUTION: THE RUHR AND THE SULFURIC TRIANGLE](#)
- [4. KEY LOCATIONS IN JAPAN'S AIR POLLUTION HISTORY](#)
- [5. KEY LOCATIONS IN WATER QUALITY HISTORY](#)
- [6. KEY LOCATIONS IN WATER MANIPULATION HISTORY](#)
- [7. CHANGES IN WORLD FORESTS, C. 1920 TO C. 1990](#)
- [8. ACTIVE FISHERIES IN THE LATE TWENTIETH CENTURY](#)
- [9. WORLD URBANIZATION SINCE 1800](#)
- [10. MAJOR OIL FIELDS SINCE 1900](#)

## TABLES

- [1.1 EVOLUTION OF WORLD GDP, 1500–1992](#)
- [1.2 PER CAPITA WORLD GDP SINCE 1500](#)
- [1.3 WORLD POPULATION SINCE 1820](#)
- [1.4 WORLD FUEL PRODUCTION, 1800–1990](#)
- [1.5 WORLD ENERGY USE, 1800–1990](#)
- [2.1 AVERAGE ANNUAL TRANSPORT OF ROCK AND SOIL](#)
- [2.2 WORLD COAL OUTPUT, 1850–1995](#)
- [2.3 POPULATION DENSITY OF RWANDA, 1910–1996](#)
- [3.1 SOME IMPORTANT TRACE GASES IN TWENTIETH-CENTURY HISTORY](#)
- [3.2 WORLDWIDE METAL EMISSIONS TO THE ATMOSPHERE, 1850–1990 54](#)
- [3.3 SOME AIR POLLUTANT EMISSION RATES IN THE TWENTIETH CENTURY](#)
- [3.4 MEXICO CITY POPULATION, 1900–1997](#)
- [5.1 ESTIMATED GLOBAL FRESHWATER USE, 1700–1990s](#)
- [5.2 CONTINENTAL DISTRIBUTION OF WATER USE, 1900–1990 122](#)

[5.3 NORTH-SOUTH ENVIRONMENTAL COMPARISON IN THE MEDITERRANEAN, 1985](#)

[6.1 GLOBAL IRRIGATED AREA, 1900–1990](#)

[7.1 APPROXIMATE EVOLUTION OF GLOBAL VEGETATION COVER TO 1990](#)

[7.2 TRACTORS IN THE USA, USSR, AND WORLD, 1920–1990](#)

[7.3 YIELD HISTORY IN 93 DEVELOPING COUNTRIES, 1961–1992](#)

[8.1 GLOBAL FISH CATCH, 1800–1996](#)

[8.2 GLOBAL LIVESTOCK POPULATION, 1890–1990](#)

[9.1 REGIONAL POPULATION, 1750–1996](#)

[9.2 URBAN PROPORTIONS, 1890–1990](#)

[9.3 DAILY METABOLISM OF HONG KONG, 1971](#)

[12.1 THE MEASURE OF THE TWENTIETH CENTURY](#)



At the beginning of the twentieth century, humankind in the West had already become aware that its collective economic activities were doing strange things to the environment. Salmon could no longer migrate upstream through chemical-tainted waters. The air surrounding industrial cities—and further afield, as the winds moved on—was full of particles of burned fossil fuels. Smog took the lives of thousands with respiratory problems each year. Huge gashes had been carved in the landscape to gain access to fresh coal supplies, and ugly heaps of slag blotted once-pleasant countrysides.

The twin sources of this environmental havoc were also known to observers in 1900. The first was that the world's human population, which had grown rather slowly for almost four million years, began to accelerate in the late eighteenth century and still showed no signs of slackening. The second was that human economic activity had also accelerated ever since the post-1760 Industrial Revolution had allowed the substitution of inanimate for animate energy. All this caused intellectuals like the Cuban José Martí and the Englishman H. G. Wells to wonder whether this immense surge in human activities could be sustained in the decades to come without degrading nature.

Had such writers survived another 100 years, they would have been amazed at the even-greater pace of change that the twentieth century witnessed. The world's population quadrupled in that time, the global economy expanded 14-fold, energy use increased 16 times, and industrial output expanded by a factor of 40. But carbon dioxide emissions also went up 13-fold, and water use rose 9 times. Not all of this meant bad news—indeed the productivity increases of the twentieth century raised the living standards of hundreds of millions of human beings out of their forefathers' ghastly poverty—but the sheer size and intensity of the transforming processes also meant that the history of the twentieth century really *was* different, in environmental terms, from that of any preceding periods.

The twin challenge to all intelligent world citizens is, first, to understand the sheer dimensions of environmental change (and the many results thereof) in this past century; and, second, to think sensibly about how these problems might be addressed before dangerous thresholds are breached by our unwitting, collective activities. This message of first comprehending and then responding to environmental change is the hallmark of Professor McNeill's brilliant and remarkably concise examination of the past century. As his title makes clear, at least in this case Ecclesiastes may have been wrong in claiming that there was “nothing new under the sun.” For what McNeill demonstrates in the seven chapters of Part One is that in all of the “spheres” that surround us—the lithosphere and pedosphere, the atmosphere, the hydrosphere, and the biosphere—we humans have impacted our planet more deeply in the twentieth century than we did in all previous history combined. One statistic alone sums this up: according to McNeill's (rough) calculations, humans in the twentieth century use *ten times* more energy than their forebears over the entire thousand years preceding 1900.

But Professor McNeill is not a mere recorder of environmental change. What really interests him is the interaction between what he calls “the planet's history and the people's history”—which is why the chapters in Part Two of this book are equally, perhaps even more, important. Here he deftly analyzes the elements of population growth, migration, technological change, industrialization, international politics, ideas—and their many “feedback loops” into the realm of environmental policies.

McNeill is neither a Luddite, nor a dogmatic “no-change-at-all” environmentalist. But he does caution us to be prudent, and to *take action*, lest the ecological thresholds that global society is steadily approaching are in fact closer than we think.

*Something New Under the Sun* is a clearly written and immensely insightful book. It carries a

message that is deeply sobering, and deserves the widest attention from publics and politicians alike.

---



## Acknowledgments

---

Without the help and support I received on it, this book would not have been ready until well into the twenty-first century, and it would have been a longer and lesser book. Several of my colleagues in the History Department at Georgetown University critiqued the manuscript, in most cases in its entirety, which claimed a good chunk of their time in the summer of 1998: Tommaso Astarita, Carol Benedict, Emmett Curran, Catherine Evtuhov, Alison Games, David Goldfrank, Andrzej Kaminski, David Painter, Aviel Roshwald, Jack Ruedy, Jordan Sand, Jim Shedel, Judith Tucker, John Tutino. Their collective expertise saved me from countless embarrassments. Other Georgetown colleagues read sections of the manuscript with equally helpful effects: Janice Hicks of the Chemistry Department; Martha Weiss from Biology; Tim Beach, Murray Feshbach, and Richard Matthew of the School of Foreign Service; and Steve King of the Government Department. I feel fortunate to work at a university where colleagues cheerfully shoulder burdens such as those I placed on this group.

Several of my students at Georgetown in 1998–1999 read parts of the manuscript and—gleefully—found ways to improve it: Dan Brendtro, Eric Christenson, Julie Creevy, Brett Edwards, Katie Finley, Justin Oster, and Jill Wohrle. Students from another time, the early 1990s, hooked me on world environmental history by their enthusiastic work in the best class I have ever taught: Sean Captain, Brad Crabtree, Nancy Golubiewski, Elena Garmendia, and Terri Willard. They helped spur me on by asking about progress on the book as the years ticked by.

Friends, relatives, and colleagues—pleasantly overlapping categories—elsewhere who read all or parts of the manuscript and improved it include Peter Campbell, Bill Cronon, Rebekah Davis, Don Hughes, John Kelmelis, Greg Maggio, Bob Marks, Elizabeth McNeill, William McNeill, and Kent Redford. I am also grateful to Alison Van Koughnett and George Vrtis for their help in sending useful research material my way.

I was able to work full-time on this book for two consecutive years thanks to the generous support of several institutions. The Fulbright program made possible six months' work in New Zealand, spent in the delightful environment of the University of Otago History Department. I thank Rob Rabel and Erik Olsen for arranging and smoothing my stay on the riviera of the subantarctic, where serious thinking on the book began. The Woodrow Wilson International Center for Scholars granted me a fellowship in 1996–1997 and provided a bracing intellectual environment, especially at lunchtimes. Many of the Fellows from that year helped me along in my work, most notably Temma Kaplan and Wolf Fischer. The Wilson Center also provided research assistants who made my task far easier: Christian Kannwischer, Peter Kocsis, Angeliki Papantoniou, and Toshuko Shironitta. In 1997–1998 the Guggenheim Foundation provided fellowship support which allowed me to stay holed up in my attic and complete the first draft of the manuscript. And Georgetown University granted me leave of absence for these two years, as well as additional research support over the years.

On several occasions I have received useful questions or comments from listeners patient enough to hear me out on the subjects of this book. These include audiences at the University of Otago, Massey University, and the University of Canterbury in New Zealand; at the University of Wisconsin, Carnegie-Mellon University, and the University of Amsterdam; and the Futures Group of the United States Environmental Protection Agency.

I started this book because Paul Kennedy, the general editor of Norton's Global Century series, asked me write it. I thank him for the faith he showed early on, and his patience thereafter. I also thank Steve Forman at Norton, who kept the book from growing to twice its final length, shamed me repeatedly with (or is it "by"?) his improvements to my prose, and kept up a steady barrage of

encouragement. Susan Middleton earned my gratitude with her relentless efforts to achieve consistency and precision in my prose.

---

I finished the book because Julie Billingsley worked long and hard to allow me to. She sustained me over the years in ways too numerous to count.



---

sample content of *Something New Under the Sun: An Environmental History of the Twentieth-Century World* (The Global Century Series)

- [Practical Ideas for Small Spaces online](#)
- [Don't Call It That: A Naming Workbook here](#)
- [\*Batman and Philosophy: The Dark Knight of the Soul\* \(The Blackwell Philosophy and Pop Culture Series\) online](#)
- [download online \*The Smashing Book #3: Redesign the Web\* book](#)
- [click \*The Internet is a Playground: Irreverent Correspondences of an Evil Online Genius\*](#)
- [read online \*Why Women Have Sex: Understanding Sexual Motivations from Adventure to Revenge\* \(and Everything in Between\)](#)
  
- <http://www.netc-bd.com/ebooks/Insight-Guides--Taiwan.pdf>
- <http://flog.co.id/library/Spirit-and-Place.pdf>
- <http://bestarthritiscare.com/library/Oswald-s-Tale--An-American-Mystery.pdf>
- <http://transtrade.cz/?ebooks/El-Silmarillion.pdf>
- <http://musor.ruspb.info/?library/Switzerland--DK-Eyewitness-Travel-Guide-.pdf>
- <http://berttrotman.com/library/Hands-of-My-Father--A-Hearing-Boy--His-Deaf-Parents--and-the-Language-of-Love.pdf>