



PERILS OF PROGRESS

Environmental Disasters in the Twentieth Century

Andrew L. Jenks

California State University, Long Beach

Prentice Hall

Boston Columbus Indianapolis New York San Francisco Upper Saddle River
Amsterdam Cape Town Dubai London Madrid Milan Munich Paris
Montreal Toronto Delhi Mexico City Sao Paulo Sydney
Hong Kong Seoul Singapore Taipei Tokyo

Editorial Director: Craig Campanella
Editorial Assistant: Amanda Dykstra
Executive Editor: Jeff Lasser
Director of Marketing: Brandy Dawson
Senior Marketing Manager: Maureen Prado-Roberts
Production Manager: Meghan DeMaio
Creative Director: Jayne Conte
Cover Designer: Suzanne Behnke
Manager, Visual Research: Beth Brenzel
Manager, Rights and Permissions: Zina Arabia
Image Permission Coordinator: Rita Wenning
Manager, Cover Visual Research & Permissions: Karen Sanatar
Cover Art: Igor Kostin/Sygma/Corbis
Maps: Alliance Publishing
Full-Service Project Management: Sadagoban Balaji
Composition: Integra Software Services
Printer/Binder/Cover Printer: Courier Companies

This book was set in Palatino.

Chernobyl – The Aftermath

Liquidators cleared radioactive debris off the roof of number 4 reactor, throwing it on the ground where it would later be covered by the sarcophagus. These “biological robots,” who ran on the top of the roof of the damaged site, in Chernobyl, could stay no longer than 60 seconds (announced by a wailing siren.) As a general rule, they only had time to place themselves by a pile of debris, lift a shovel-load and throw it on among the ruins of the reactor. Normally, the liquidators ascended the roof only once because the radiation dose they received was the maximum authorized dosage a human being should receive in a lifetime

Credits and acknowledgments borrowed from other sources and reproduced, with permission, in this textbook appear on appropriate page within text.

Copyright © 2011 Pearson Education, Inc., publishing as Prentice Hall, One Lake St., Upper Saddle River, NJ 07458. All rights reserved. Manufactured in the United States of America. This publication is protected by Copyright, and permission should be obtained from the publisher prior to any prohibited reproduction, storage in a retrieval system, or transmission in any form or by any means, electronic, mechanical, photocopying, recording, or likewise. To obtain permission(s) to use material from this work, please submit a written request to Pearson Education, Inc., Permissions Department, One Lake St., Upper Saddle River, NJ 07458.

Library of Congress Cataloging-in-Publication Data

Jenks, Andrew L.

Perils of progress : environmental disasters in the twentieth century / Andrew L. Jenks.—1st ed.

p. cm.

Includes bibliographical references and index.

ISBN-13: 978-0-13-603802-3 (alk. paper)

ISBN-10: 0-13-603802-6 (alk. paper)

1. Disasters. 2. Environmental disasters. I. Title.

HC79.D45J46 2010

363.73809'04—dc22

2010003397

10 9 8 7 6 5 4 3 2 1

Prentice Hall
 is an imprint of



www.pearsonhighered.com

ISBN 13: 978-0-13-603802-3

ISBN 10: 0-13-603802-6



Contents

FOREWORD	vi
SERIES EDITOR'S PREFACE	viii
ABOUT THE AUTHOR	xiv
ACKNOWLEDGMENTS	xv
INTRODUCTION	1
Modernity's Pollution Problems	2
Methodology	4
The Four Horsemen of the Toxic Apocalypse	5
Common Themes to Consider	7
The Blame Game	8
Conspiracy Theory and Historical Amnesia	10
The Moral Dimension	11
1 THE MINAMATA DISASTER AND THE TRUE COSTS OF JAPANESE MODERNIZATION	13
Chisso Corporation	14

iv **Contents**

Disturbing Signs	16
Political and Cultural Obstacles	17
Lifting the Veil of Silence	18
The Battle Rejoined	20
Atomic Bombs, Godzilla, and the Culture of Victimization	21
Seeking Justice Outside the Courts	24
The Uniqueness of the Japanese Case	25
Minamata as a Global Event	27
The Appeal to Emotion	28
A New Way to Calculate Progress	29
A Lingering Toxicity	31
Sources	33
<i>Struggling with the Disease</i>	33
<i>Those Who Remain Are Like Embers</i>	35
<i>The Confrontation at Goi</i>	37
<i>"Let a Feather Drop Onto Their Heads. . . .": The Chisso Corporation Defends Itself</i>	39

**2 LOVE CANAL AND THE LAW OF UNINTENDED
CONSEQUENCES 43**

The Unspoken Bargain	45
The Bargain Re-evaluated	48
Reports of Mysterious Substances	49
Science in the Service of the State	53
Long-Term Social and Political Effects	57
"Revitalizing" the Community	60
Sources	63
<i>A Child's Death</i>	63
<i>A Curious Tax Audit</i>	65
<i>Passing the Buck</i>	66
<i>And Who Was Responsible?</i>	68

**3 THE BHOPAL GAS TRAGEDY: A PERFECT STORM
OF INJUSTICE 70**

India, Union Carbide, and the Green Revolution	72
Complacency	76
Corporate and Popular Responses	78
Finger Pointing	82

The Legal Drama	83
A Silver Lining?	87
The Disaster Industry	88
Sources	91
<i>Profit at All Costs?</i>	91
<i>Safety First?</i>	94
<i>A Medical Professional's Perspective</i>	96
<i>A Grassroots Perspective</i>	102
<i>The Controversy Continues</i>	104

4 THE TECHNO-POLITICS OF DISASTER: CHERNOBYL AND THE COLLAPSE OF THE SOVIET UNION 106

Anatomy of an Accident	108
Political Fallout and Historical Context	111
Evacuation	115
The Blame Game	117
Toward an Explanation	119
Casualties and Health Consequences	121
Chernobyl after Chernobyl	126
Sources	127
<i>A Misfortune Has Befallen Us</i>	127
<i>The Western Nuclear-Power Industry Reacts</i>	129
<i>The Myth of Chernobyl?</i>	131
<i>Victims and Heroes: Voices from Chernobyl</i>	133

EPILOGUE: MAKING CONNECTIONS 136

An Exception to the Rule	138
Language and Metaphor	139
Technological Transfers and the Web of Connections	140
The Cost-Benefit Calculus of Progress	141
Disasters as Cultural Mirrors	143
Disaster Imaginations	145

BIBLIOGRAPHY 148

INDEX 156



Foreword

Connections: Key Themes in World History focuses on specific issues of world historical significance from antiquity to the present by employing a combination of explanatory narrative, primary sources, questions relating to those sources, a summary analysis (“Making Connections”), and further points to ponder, all of which combine to enable readers to discover some of the most important driving forces in world history. The increasingly rapid pace and specialization of historical inquiry has created an ever-widening gap between professional publications and general surveys, especially surveys of world history. The purpose of *Connections* is to bridge that gap by placing the latest research and debates on selected topics of global historical significance, as well as some of the evidence upon which historians base their insights, into a form and context that is comprehensible to students and general readers alike.

Two pedagogical principles infuse this series. First, students master world history most easily if allowed to focus on specific themes and issues. Such themes, by their very specificity, as well as because of their general application, enable students to perceive and

Foreword **vii**

understand the overall patterns and meaning of our shared global past more clearly than is possible through reading, by itself, a massive world history textbook. Second, students learn best when asked to think critically about what they are studying. So far as the study of history is concerned, critical thinking necessarily involves analysis of primary sources.

To that end, we offer a series of brief, tightly focused books that embrace a radical simplicity and a provocative format. Each book goes to the heart of a key theme, phenomenon, or issue in world history—something that has connected humans across cultures, continents, and time spans. By actively engaging with this material, the reader comes to understand in a nuanced and meaningful manner how often distantly located human cultures have been connected to one another as key actors in the epic story of world history.

Alfred J. Andrea
Series Editor
Professor Emeritus of History
The University of Vermont



Series Editor's Preface

"Vermont: We were green before green became cool." That aphorism graced a number of T-shirts and hats in downtown Burlington on Saturday, June 13, 2009, as thousands of Vermonters and visitors alike enjoyed the sunny weather and the last several days of another successful jazz festival. And who would be so foolish as to deny the people of this state that boast? This is the land of Ben and Jerry's ice cream, made from family farm-produced hormone-free milk. This is the land of farmers' markets in almost every village and town, where one can purchase seasonally correct, organic, free-range, antibiotic-free meats, cheeses, eggs, vegetables, and fruits. This is the state that in 1970, under the active leadership of an otherwise conservative Republican governor, passed the pioneering Land Use and Development Act, better known as Act 250, that established nine district environment commissions tasked with reviewing closely and judging the merits of all permit applications for any development project of 10 acres or more, to ensure that such projects would not have an adverse effect on the environment, especially in regard to water and air pollution. This is the state that sent to Washington Republican

senator Robert Stafford, who, more than any other member of the Congress, was responsible for championing and protecting the integrity of national clean air and clean water legislation. Yes, this land of Birkenstock-wearing, Prius-driving, tofu-eating, tree-hugging environmentalists takes pride in its self-image: a state in which careful stewardship of the land trumps mindless pursuit of profits.

This stereotype might please Vermont chambers of commerce, and it certainly sells large amounts of pure maple syrup and other products whose "Made in Vermont" stamps carry a cachet that assures high prices and a ready clientele in urban upscale markets across the United States. But as any student of history instinctively knows, it cannot be and is not the whole story. To be sure, Vermont has known no environmental disasters of anywhere near the magnitude of the four highlighted in this marvelous little book. Nevertheless, this state, so well known for its environmental activism, faces toxic challenges that threaten the health and well-being of its residents.

The poisoning of some fish species in Lake Champlain, North America's sixth largest body of fresh water, by the effluent formerly discharged into the lake by International Paper's Ticonderoga Paper Mill in neighboring New York pales into insignificance when compared to the poisoning of Japan's Minamata Bay, described in Chapter 1. And yet Lake Champlain provides the drinking water for most of the people living along its shores, including the city of Burlington, and the toxic wastes discharged by the Ticonderoga Paper Mill remain on its fragile lakebed. What is more, chemicals sprayed on the lawns of Burlington and the towns and cities of Vermont, New York, and Quebec that border this immense body of water run into the lake and help feed a rapidly growing blue-green algae (Cyanobacteria) that is choking the lake and posing a serious threat to the health of humans and animals alike. To be sure, chemical fertilizers are only one source of the problem; even greater sources are the manure spread on frozen fields near the lake and the phosphorus-rich gray water of washing machines. Currently, the state is commemorating the 400th anniversary of Samuel de Champlain's "discovery" of the lake. Thanks to the "progress" of development, much of the shoreline has changed substantially since 1609. One wonders if, despite the best efforts of the Lake Champlain Land Trust to buy up portions of the shoreline to serve as buffer areas against this chemical invasion and the equally active efforts of the state's Agency of Natural Resources to regulate and educate, the lake will be choked into a state of near or total necrosis by 2109.

x *Series Editor's Preface*

Vermont has nothing to compare with Love Canal, which, as described in painful detail in Chapter 2, is a prime example of the human cost of irresponsible toxic waste “management.” But Burlington has its Pine Street Barge Canal, which in 1983 became a local Superfund poster child. In the mid-1800s, as Burlington’s lakeside lumber business boomed, a local entrepreneur transformed a “miasmatic frog pond,” what today we would call a vital wetland, into a barge canal, complete with a drawbridge, that linked the vessels plying the lake with nearby lumber mills and the railway system that ran along the lake. When the lumber industry went bust in the 1890s, a number of other businesses, especially coal dealers, filled the void and occupied the area around the barge canal on Burlington’s waterfront. A plant that converted coal and oil into gas for streetlights and home heating soon opened on the site, and it began the process of dumping coal tar and other equally dangerous waste products into the waters and on the surrounding wetlands of the canal until the plant ceased operations in 1966. The result was contamination by a lethal combination of heavy metals and chemicals. Given the slow process of scientific and bureaucratic investigation and review and the number of competing theories and voices, it took 20 years to find and execute an agreeable solution as to how to return the area to a reasonable state of nontoxicity. By 2004, eight acres of the most heavily contaminated sediments were capped and serious efforts at habitat restoration were completed. Some coal tar gases continue to be released in one area, but by and large the means taken seem worth the wait and expended resources. Monitoring of the site continues.

Without any major chemical plants, Vermont has little reason to fear a Bhopal-like cloud of choking gasses descending on a sleeping community, as described in Chapter 3. But living as I do close to the railway tracks that run along the east coast of Lake Champlain, it is disquieting to see on a daily basis tanker cars containing a variety of deadly chemicals rolling along the tracks at any time of day or night, headed for unknown destinations. Our local fire department and other emergency responders are well trained for any eventuality, but one does have to wonder what would happen should there be an accident or act of terrorism. But in this world where “better things for better living . . . through chemistry,” as the old DuPont advertising slogan boasted, is a reality, one has to trust the safeguards and probabilities. Toxic chemicals, whether we like it or not, are an integral part of our society and its economic infrastructure, and even supposedly isolated



The Pine Street Barge Canal with tanker cars full of chemicals in the background. (Alfred J. Andrea)

Shangri Las, such as Vermont, must bear the risk of living in close proximity to them.

That said, the cost of even relative safety is eternal vigilance. Yesterday's *Burlington Free Press* led with the story of a trash-to-energy debate concerning the plans of an electric utility and a major trash hauler to construct several plants where solid waste would be converted to energy. One does wonder what the effects on air quality will be, apart from undermining recycling and waste-reduction programs, especially if the known carcinogen dioxin is released. Needless to say, environmentalists and scientists are lining up on both sides of the debate. In this most imperfect of worlds, it is never easy to choose the best or least objectionable and least dangerous alternative. The Union Carbide pesticide plant in Bhopal, India, promised to produce cheap pesticides, which would be an integral component of the Green Revolution that would feed India's then hundreds of millions of people. Who could have foreseen the deadly fog that would descend on the city in December 1984?

xii *Series Editor's Preface*

Other than the near meltdown at Three Mile Island in 1979, the United States has been spared any nuclear power plant disaster, and certainly the Three Mile Island incident paled when compared with what took place at Chernobyl in April 1986, as we learn in Chapter 4. Surely both incidents seem so far away from Vermont, where so many folks heat at least partially with wood (thus adding to air pollution and resultant respiratory ailments in a substantial manner). But even bucolic Vermont has a nuclear power plant, Vermont Yankee. While its safety record is good, it is not spotless. More troubling is an Associated Press bulletin, which appeared in newspapers throughout the state, that the company that owns it and almost half of the nation's other nuclear reactors has not been setting aside sufficient funds for their inevitable and fast-approaching decommissioning and dismantlement, thus raising fears of safety and security risks.

As Andrew Jenks points out so well in this book, which studies four of this century's most infamous and deadly toxic disasters, progress comes at a great potential price, and that price can be multiplied many times over when pursuit of profits trumps prudence. Moreover, the tragedy can and will be exacerbated when civic and corporate leaders fail to acknowledge or adequately deal with the causes and consequences of a disaster.

It would be foolish for anyone in the twenty-first century to advocate a return to an earlier and putatively cleaner way of life. Humans have been poisoning their environment and themselves since at least the discovery of fire, and many of the agreeable benefits of contemporary life would not be available to so many so inexpensively were it not for the chemicals used in the production of those benefits and the energy from nuclear reactors that drives their machines. What is more, no place on earth, even such mythically pristine sites as Vermont, is totally free from the dangers of a toxic cataclysm. That noted, there is much that we, as responsible citizens, can and should do to reduce the inherent dangers of contemporary manufacture, and there is much that we can do to mitigate suffering if and when the next toxic disaster occurs.

This book should be read and carefully studied by anyone who is at all interested in furthering a clean and safe environment while simultaneously encouraging responsible manufacturing. Life as we know it demands both. But when reading this book, do not look for facile answers. They do not exist. What can be gained from this book, as is

Series Editor's Preface **xiii**

true of any nuanced study of the past conducted by a master historian, is insight and wisdom—two qualities that prepare us to anticipate and head off potential environmental disasters and, even, sad to say, meet and deal rationally with the next toxic apocalypse.

Alfred J. Andrea
Series Editor



About the Author

Dr. Andrew Jenks, an associate professor of history at California State University, Long Beach, is a specialist in Russian history, history of technology, and environmental history. In addition to publishing numerous articles in scholarly publications on a range of topics, he has authored a book on Russian national identity, *Russia in a Box: Art and Identity in an Age of Revolution*, Northern Illinois University Press, and is currently finishing a biography of the world's first man in space, Yuri Gagarin, *The Cosmonaut Who Couldn't Stop Smiling: Yuri Gagarin and the Many Faces of Modern Russia*, Northern Illinois University Press. Before receiving his Ph.D. in Russian history and history of technology from Stanford University in 2002, Jenks worked in the 1990s as a journalist and editor in Washington, D.C., where he covered NASA, EPA, secret military high-tech programs, and the emerging Internet business. He studied Russian language at the Pushkin Russian Language Institute in Moscow in the late 1980s, and he worked as a translator in the Moscow CNN office. He also worked on Soviet fishing boats in the Bering Sea for six months.



Acknowledgments

My wife, Deanna, and children, Alex and Elizabeth, allowed me a few moments of peace and quiet to write this book. I am grateful to Charles Cavaliere and Al Andrea for their encouragement and support. The critical comments of the anonymous readers were incisive and constructive.

My colleagues Marie Kelleher, Lise Sedrez, Ali Igmen, Hugh Wilford, and Ken Curtis at the history department of California State University, Long Beach, offered excellent comments during a 2008 presentation of this material. Arnie Kaminsky provided background on Indian history and contacts for my research trip to the city. The Yadunandan Center for India Studies at California State University, Long Beach, funded my trip to Bhopal in the summer of 2008. Deipica Bagchi arranged for interviews with Bhopal victims and was a gracious host during my stay in Bhopal.

My Russian colleague, Vitaliy Bezrogov, supplied information about Russian history textbook coverage of Chernobyl. Robert Kane at Niagara University suggested that I consider Minamata as a case study. The archivists at the New York State Archives in Albany, NY,

xvi *Acknowledgments*

the Niagara Falls Public Library in Niagara Falls, NY, and the University of Buffalo were professional and courteous. My students at California State University, Long Beach, have read or heard many versions of these chapters and their comments and criticisms were essential. Any problem with the book's content, of course, is entirely my doing.