

# Resources in Review

**Sustainable Mobility: Renewable Energies for Powering Fuel Cell Vehicles**, by Raphael Edinger and Sanjay Kaul. 2003. Westport, CT: Praeger. 134 pages. Cloth. \$64.95. ISBN 1-56720-484-8.

An estimated one-third of the emissions in the industrial world come from the transportation sector. The world is producing nearly 60 million new vehicles, many of these SUVs, each year. In this book, Edinger and Kaul point out

In this increasingly mobile world, when the transport of goods is the cornerstone of a global economy and freedom of movement is valued almost as a basic human right, it is critical that we make our transportation systems as sustainable as possible in very rapid fashion (p. *vii*).

The contention of the authors is that we have no need to wait for technological breakthroughs to find solutions to climate change. Their intention with this book is “to outline a path toward sustainable mobility” (p. 2).

The second chapter provides a historical overview of the sustainability movement, drawing on the Spaceship Earth analogy (Boulding, 1966), and culminating with a three-point guide to sustainable mobility: (a) the efficient use of limited resources, (b) starting the transition to renewable resources, and (c) investigating new concepts for mobility services. The text focuses upon the first two solutions.

The lengthy third chapter gives the reader extensive background on the nature of global climate change, the contributing factors/forces, and sustained efforts to reduce emissions of greenhouse gases. Unfortunately, although we find in the European Union that “residential households and industry have stabilized or reduced emissions, CO<sub>2</sub> emissions in the transportation sector will increase up to 39% through 2010 compared to 1990 levels” (p. 39). The U.S. Department of Energy (DoE) predicts “the U.S. passenger vehicle fleet will remain at current levels . . . [for the] next two decades” (p. 40). Clearly, to achieve sustainability in the transportation sector is a challenging and important task.

As the authors turn their investigations toward *energy for mobility*, they explore both conventional and unconventional fuel resources. Although the volume of heavy oil and oil sands is phenomenal, predicted greenhouse gas emissions from their use is accompanied by a 350% increase in CO<sub>2</sub> emissions in comparison to petroleum production. With this and other targeted issues addressed, it is very clear that the authors’ main effort is to reduce greenhouse gas emissions from transportation-related resources.

There is often confusion in the media regarding the relative environmental benefits of alternative transportation fuels such as electric cars, methanol or ethanol, etc. Edinger and Kaul point out that “a fuel itself does not guarantee zero

net greenhouse gas emissions” (p. 58). For instance, where biomass can be harvested and methanol efficiently used for transportation energy, it is possible for such a system to be relatively CO<sub>2</sub>-neutral. The CO<sub>2</sub> that is captured during plant growth is released upon combustion. However, burning methanol derived from natural gas, captured and preserved for millions of years beneath the earth’s surface, contributes additional CO<sub>2</sub> to the atmosphere.

“The same logic holds true for a hydrogen-fueled system . . . . Hydrogen produced through electrolysis using renewable electricity of wind, solar, or hydro-power is an option of greenhouse gas-free fuel production” (p. 60). When measuring total greenhouse gas emissions (in grams per Megajoule—g/MJ), the volume comes to 87 g/MJ for gasoline, and up to 99 g/MJ for hydrogen from natural gas, in contrast to the relatively low releases of 23 g/MJ for methanol from wood, or only 8 g/MJ for hydrogen from renewable electricity. These estimates are for “well-to-wheel” which includes both fuel production and energy conversion in the vehicle.

The authors make extensive use of tables and charts to describe systems and provide comparisons among alternative energy strategies. These are often quite helpful, but some may challenge readers with less engineering or scientific background. Still, the overall point is often made with the charts in combination with the text. When educators and decision-makers investigate issues of such complex nature as vehicle emissions, striving to consider both short- and long-term consequences of various alternatives, there is need for a comprehensive analysis of energy costs. Edinger and Kaul urge readers to consider that “climate-relevant emissions occur for vehicle production, fuel production (well-to-tank), and vehicle operation (tank-to-wheel)” (p. 85). Such specificity is critical if one is to develop a fully-representative picture of short, and long-term costs, both environmental and economic.

The sixth chapter is devoted to *Mobility for Developing Countries*. Using extensive figures and research from India, the authors claim that, if present trends continue, the developing countries may prove to be a rapidly growing force in global greenhouse gas emissions. The need for green fuels—fuels adapted to the local/regional natural resource base and economy—is most pronounced from a sociocultural, economic and environmental perspective.

An analogy can be drawn from the last chapter which is quite fitting for both individuals and the world as a whole. If a homeowner is to invest in renewable technologies to independently power his or her home “off the grid,” then “the high up-front investment of renewable power technologies requires a system design based on load reduction in the first place” (p. 114). In other words, if you are paying thousands of dollars for each additional kilowatt-hour of electricity you produce, then you’ll seek out the most energy-efficient appliances, and in some cases “do without” for some of your “wants.”

On a global scale, cheap and abundant oil has led to profligate use of energy for home, industry and transportation alike. If we are to successfully make the

transition toward a more energy-sustainable economy, both selectivity and efficiency must become the norm. Alternative fuels must be investigated, developed, and used. Our photovoltaic homeowner above may perhaps choose an LP-gas water heater and refrigerator as a more efficient energy source for some of their needs. In our society, we may seek to develop electric or hydrogen-fueled vehicles—using renewable energies to generate these fuels—to avoid the consequences of continued climatic change and associated environmental/societal disruption.

Overall, the full title of the text is *Sustainable Mobility: Renewable Energies for Powering Fuel Cell Vehicles*. Although the authors indeed explore fuel cell technology—much more than I have made note in this review—it is not the clear focus of the text. They explore sustainable mobility on a much broader scale, investigating the use of sustainably-harvested biomass as well as hydrogen fuel cells using renewable energies. The text can thus serve as an effective reference or background for those teaching about renewable technologies for the transportation sector, and get us all thinking about strategies to allow us to “move” into the rest of the 21st century with less damage to our surroundings and our children.

#### REFERENCE

Boulding, K. (1966). The Economics of the Coming Spaceship Earth. In Henry Jarrett (Ed.), *Environmental Quality in a Growing Economy, Essays from the Sixth Resources for the Future Forum* (pp. 3–14). Baltimore, MD: Johns Hopkins Press for Resources for the Future.

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**Environmentalism Unbound: Exploring New Pathways for Change**, by Robert Gottlieb. 2001. Cambridge MA: MIT Press. 396 pages. Paper. \$19.95. ISBN 0-262-07210-6.

In *Environmentalism Unbound*, Robert Gottlieb attempts to reframe the discourse surrounding environmental justice by considering various pathways to bring about change and new action on environmental issues. He does this in an interesting and informative way, by leading the reader through three case studies, examining the historical roots of the environmental movement, and considering future pathways that should be considered to help resolve environmental issues.

Gottlieb’s premise throughout the book is that previous discourse about environment has focused too much on natural settings and has not sufficiently taken urban locations into account. He provides a concise description of the environ-

mental movement, showing how the urban setting has been underemphasized as an environment. The many urban-related issues of poverty, industrial waste, and transportation have not been considered relevant unless they affected natural areas in some way. Gottlieb begins to make the connections by showing the dichotomy we have created in our language when city and countryside, land and resources, urban and suburban issues are considered. He examines how this can be changed so that when we talk about the 'environment' that urban areas and their issues are automatically subsumed under this word. In this way, perhaps the movement could become more real for people affected by environment-related issues in urban areas.

The case studies selected by Gottlieb are interesting in that they deal with concerns that affect us all to varying degrees. Cleaning clothes, cleaning buildings, and food are all important aspects of our daily lives, and most people reading this book will connect with them in some way. However, what he does with these case studies is to show us that we are far more connected than we think to each other and to the environment, and that everyday actions affect people and the environment. The thread of social justice is woven through these examples as an important component of any consideration of environmental justice and environmental movements.

In Gottlieb's final chapter, "Pathways for Change," he argues that we need to explore how the environmental movement is to be sustained and embraced by people who have felt excluded from it. Four components are required to achieve this (a) an ethic of place, both local and global, (b) new strategies for governance and remaking politics, (c) revaluing work and remaking industry, (d) and remaking a community of interests.

Gottlieb argues that the ability to help sustain the environment requires, on both local and global levels, that new alliances and bridges be built. Environmental problems in urban areas need to be considered as justice issues and alliances need to be created around them, encompassing all the constituents in urban areas, not just those affected, but those who are inflicting the harm. In addition, Gottlieb writes about the need to change our governance system, and cites the manner in which European politics have become somewhat refocused by the green movement and green political parties.

Gottlieb also makes a strong point about the whole idea of work being valued, or rather undervalued, by the environmental movement.

It needs to develop, as central to the environmental agenda, an approach that embraces revaluing and reskilling on the job. It needs to associate an environmental perspective with a more visionary notion of workplace democracy and what the justice-for-janitors movement has identified as the need to assert the dignity of work. Such an approach is also about asserting control over the front end as well as the outcomes of any industrial, agricultural, or service-based industry process" (p. 281).

He stresses the importance of revising the connections between work and the environment, not just the products of that work and the environment.

As for remaking a community of interests, Gottlieb writes about using a community mapping exercise to help to realize what assets a community has. In the past, this type of exercise has focused on only social assets, but he suggests that ecological assets now need to be included. In addition, in such mapping processes we have to go beyond seeing natural assets as always good and industrial ones as always bad. Finally, Gottlieb writes that “when the social and the ecological are joined together, movements for change have the capacity to become more powerful actors in the struggles to come. An environmentalism unbound can help point the way” (p. 287).

Gottlieb’s book adds another perspective to the environmental movement and environmental justice dichotomy. Although changes and partnering are beginning to happen between groups on environmental justice issues, differences still remain between them. We need to examine more closely the way in which groups can work together to solve environmental issues, and Gottlieb’s book is a good place to begin finding ways to do that.

There are some chapters of this book (Environmentalism Bounded, one of the case studies, and the Politics of Food, as well as the final chapter) that I would use with an undergraduate class, but I would consider the entire book as an excellent text for a graduate course on environmental policy, or other environmentalism-related courses.

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**Body and Earth: An Experiential Guide**, by Andrea Olsen. 2002. Hanover NH: Middlebury College Press. 245 pages. Paper. \$26.00. ISBN 1-58465-010-9.

Olsen’s book about the organic, perceptual and sensory connections of the human body and its earthy places draws successfully on a mix of somatic understandings, environmental studies and sciences, visual imagery in the form of photographs, diagrams and illustrations, and first-person narratives. Olsen is a professor of dance and faculty member in environmental studies, with a self-professed “amateur” academic background in the science of anatomy. She is also a practitioner-teacher of yoga. Olsen is, therefore, well qualified to pursue the crucially important question many environmental education teachers and researchers are now asking about the reconciliation of those ‘crisis-like’ ruptures between ‘inner’ and ‘outer’ natures.

Olsen's text is pedagogically ordered around 31 days, or equivalent "learning sessions." These days are thematically organized into three sections, namely "Underlying Patterns and Perceptions," "Body and Earth," and "Connections." Each "Day" about five pages of text is made up of an information/content-driven anecdote and visual imagery about, for example, attitudes, perception, soil, bioregionalism, bones, emotion, animals, or digestion. These conceptualisations of the body and earth are followed by instructions about things "to do," a "place to visit" and a "performance text." The "to do" instructions aim for "movement exploration"; the place visit asks the reader to explore and investigate a local/private site, be it his or her body or an enjoyable setting at home, in the neighbourhood, a park, or even at work. Time should be allowed at the end of the "place visit" to reflect and write about the experience, either individually or with a partner. Olsen's "performance text" is a reflective and more poetic account or story about her own experiences of various places. They evocatively demonstrate how and what readers might reflect upon when experiencing their own places.

*Body and Earth* will appeal primarily to the liberally inclined educator working in flexible undergraduate and postgraduate settings and, more generally, to "new agers" or "self-helpers." Olsen's *Experiential Guide* successfully aims "to help us reflect on what has shaped our attitudes and ideas about the world and about ourselves." (Author Query: Please provide page number for direct quote) In many respects, Olsen's audience is asked to be introspective and worldly at the same time. She notes, "the body is the medium through which we experience ourselves and the environment." (Author Query: Please provide page numbers for direct quote) For me, one of the greatest strengths of the book is its pursuit of the interdisciplinary and the holistic, blending of the intellectual and aesthetic, and melding of the local and global.

For the academically inclined reader, Olsen avoids locating her ideas in phenomenology despite them being a work in social ontology. Nor for environmental educators does she overtly connect her ideas to, for example, Dewey's notion of the organism-environment interaction as a form of experiential growth. Instead, it is implied. For researchers, she does not relate her text about "lived experience" methodologically to genres of enquiry now evident in the field's research endeavours such as grounded theory, hermeneutic phenomenology, or narrative. Again, they are implied. Olsen's style may be a strength or weakness, depending on the readership, as might also be her preferred pedagogy about things "to do." Some will welcome Olsen's *Experiential Guide*; imaginative self-helpers will ignore her instructions; others will find some middle ground and use the guide as a sensitizer. The book is, undoubtedly, positive in its affirmation of the body-earth connection. Some may criticize it for its romantic or deep tendency to make invisible, or transcend, the socially and culturally constructed 'already there' toxicities of human bodies and the earth, social problems of places and neighbourhoods, and inequitable access of certain individuals and groups to those natural resources and other cultural spaces such as a backyard

whose widespread availability is all too often easily presumed. Put differently, some might argue Olsen's need to include social natures in the reconciliation of inner and outer natures if the problematic human-environment and culture-nature relations are, first, to be revealed and, second, repaired.

In sum, Olsen's book contributes positively to the way environmental educators and researchers might rethink the role of experience and the "site" of the body in their educational work. Her evocatively presented but somewhat atheoretical contribution is important and significant because the perceiving and acting body has been chronically excluded from the discourse of environmental education. As John Elder notes in the book's Foreword, "Such heightened awareness may move us past abstract concern for the environment to a more immediate and physical identification with the earth" (p. xiii). Olsen's book will appeal vividly to the increasing number of environmental educators who are now acknowledging that the primary focus on "outer" environments, wildernesses and other exotic/sublime versions of nature, although important for some purposes, serves also to reproduce the disembodied, demoralizing, disempowering, disengaged, and disenchanting human-environment and culture-nature dualisms that are part of the problem.

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**Ecoregion-Based Design for Sustainability**, by Robert G. Bailey. 2002. New York: Springer-Verlag. 232 pages. Paperback. \$49.95. ISBN: 0-387-95430-9; Hardcover. \$119.00. ISBN: 0-387-95429-5.

Many attempts have been made to classify Earth's life regions. Initial efforts were by botanists who noticed that the world could be divided into blocks of vegetation more or less on a continental scale and separated by oceans, mountain ranges, and deserts. Zoologists who made a similar effort noticed that it was substantially more difficult to map the distribution of animals.

Alfred Russell Wallace was one of the first to attempt to classify the distribution of animals with his development of biogeographical regions (realms) in 1876. With some modification, his classification system is still used today. In 1898, C. Hart Merriam developed a system in which he identified life zones. His system was once widely accepted, but is rarely used today. L. R. Dice introduced his concept of biotic provinces in 1943, and his system is still used at times by mammalogists, ornithologists, and herpetologists. V. Shelford developed the biome concept in 1943. His concept remains the most commonly identified clas-

sification scheme in environmental science texts; however, the number and classes of biomes and the boundaries between them vary from one expert's opinion to another. Holdridge developed a life zone system in 1967. His effort represented an advance from an environmental management perspective in that he considered climate as the determining factor in plant formations.

Bailey's ecoregion classification strategy builds on his predecessors but advances the ecological basis by which scientists and land use planners, for example, may understand the distribution of plants and animals, and most importantly, make decisions about human actions.

*Ecoregion-based design for sustainability* represents the third effort in Bailey's trilogy that includes *Ecosystem Geography* (1996) and *Ecoregions: The Ecosystem Geography of the Oceans and Continents* (1998). The ecoregion concept is based on the presumption that ecoregions are continuous geographical areas across which the interaction of climate, soil, and topography are sufficiently uniform to permit the development of similar types of vegetation. The purpose is to provide a foundation for ecological management of resources. Because each ecoregion has its own distinctive flora, fauna, climate, soil, and landform, each requires its own approach to management. Bailey illustrates the usefulness of his concept by observing that "many . . . continue to look at the environment piecemeal by focusing on the impact on a small area . . . [but] we must consider the larger geographic scale of human impact in our land-management and conservation programs" (p. vii). In this volume, Bailey synthesizes and illustrates the key principles of design and planning that relate to ecoregions and expand ecoregion concepts to include the human factors. He moves beyond defining ecoregions, to showing how an awareness of that definition can play a significant role in the search for sustainability (p. vii). **(Author Query: Is this a direct quote? If so, where should the quotations be placed?)**

Chapter 1 serves as an introduction or primer for readers who may be unfamiliar with the ecoregion concept. Chapter 2 deals with the interconnectedness of ecosystems and how the ecoregion concept addresses this relationship. How ecologically compatible designs may be more clearly identified by recognizing the ecoregion concept is also emphasized. Chapter 3 illustrates how ecoregions compare to other land divisions and describes how ecoregions are mapped. Chapter 4 draws on historical patterns of human settlement to show how we have actually moved away from practices that were more ecologically sustainable and more reflective of ecoregions. Chapter 5 focuses on the significance of the ecoregion concept to environmental management. Chapter 6 discusses how the ecoregion concept is currently being implemented by various land-management or conservation groups. Chapter 7 is a summary.

Clearly, land-use issues, specifically as they relate to the ever-increasing human domination of the landscape, are going to require a new way of thinking about how humans attempt to manage their actions. Educators are likely to have a major role to play in helping to transition from a culture of unrestrained con-



sumption to one of reasoned conservation. Knowing about and understanding ecoregions will be key to doing so. Ecological principles such as the competitive exclusion principle and the resource partitioning concept are complemented by the ecoregion concept and vice versa. By integrating these three ideas into one unified approach to managing human actions, the quest for sustainability may be enhanced.

I strongly recommend *Ecoregion-Based Design for Sustainability* to any educator interested in remaining current with the efforts to manage human actions in order to achieve the highest possible level of ecological integrity—that is, ecologically sustainable development. The book is written in simple terms and includes numerous color graphics and a glossary of terms that support the text. Although not essential, I strongly recommend reading the trilogy in sequence. It is especially important that educators familiarize themselves with the ecoregion concept since the scientific and resource management communities appear to have already done so, as witnessed by the fact that Bailey has been cited over 500 times and his ecoregion concept has been used in nearly 150 scholarly studies.

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**Beyond Earth Day: Fulfilling the Promise**, by Gaylord Nelson, with Susan Campbell and Paul Wozniak. 2002. Madison: University of Wisconsin Press. 201 pages. Cloth. \$26.95. ISBN 0-299-18040-9.

Buy it! Read it! Pass it on! Give copies as gifts! This is one of those books that everyone should read if they are interested in having a future for mankind on Earth.

I first came in contact with Gaylord Nelson back in 1962 at a national Conservation Education Association meeting in Wisconsin, where he was then governor. I had a “wet behind the ears” distrust of all politicians, but his keynote address presented some convincing, practical ideas of how to use political ploys such as “pork barreling” to create win-win situations to advance conservation education. It was eye opening. He went on to become Senator Nelson, one of the sanest,

most committed voices for protecting America's natural resources over the last century.

Most widely known as the father of Earth Day, Gaylord Nelson's fingerprints are on a wide range of some of the most important environmental legislation we have. His work has continued long after he left the Senate. This book is more than just a simple statement of the history and development of Earth Day; it is a sage look at how far we have come and where we still have to go in this new century and beyond.

The book is divided into four sections: "The Earth and Its Day," "Imperiled Planet," "Environmentalism Then and Now," and "An Environmental Agenda for the 21st Century: Achieving Sustainability." The information it contains is well documented and time is devoted not only to what needs to be done but also to who needs to do what. The foreword by Robert Kennedy, Jr. is insightful concerning the nature of environmentalism.

Gaylord Nelson has long been an advocate for more and improved environmental education. Unlike the works of many other environmental writers, this book contains some strong sections on the need for and expansion of environmental education. From among the many important basic passages from this book I quote the following:

Intellectually, we finally have come to understand that the wealth of the nation is its air, water, soil, forest, minerals, rivers, lakes, streams, scenic beauty, wildlife habitats, and biodiversity. Take this resource base away, and all that is left is a wasteland. In short, that's all there is. That is the whole economy. That's where all the economic activity and all the jobs come from. These biological systems contain all the sustaining wealth of the world. **(Author Query: Please provide page numbers for block quotes.)**

These same systems are under varying degrees of stress and degradation in most places around the planet, including the United States. As we continue to degrade them, we are consuming our capital. In the process, we erode living standards and compromise the quality of our own habitat. **(AQ: page numbers?)**

It is a dangerous and slippery slope. **(AQ: page numbers?)**

We are not just toying with nature. We are compromising the capacity of natural systems to do what they need to do to preserve a livable world (p. 157). **(Author Query: Are all the quotes from page 157?)**

We would all do well to heed Gaylord Nelson's insights and to involve our leaders and ourselves in pursuing the proposed agenda. The book is not long and windy. It lends itself to reading in a reasonable period of time, and is well worth every minute spent with it.

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**The Unending Frontier: An Environmental History of the Early Modern World**, by John F. Richards. 2003. Berkeley: University of California Press. 682 pages. Clothbound. \$75.00. ISBN 0-520-23075-2.

Understanding how all humans got to be in environmentally degraded predicaments on this planet means more than just knowing about the problems and issues that exist now. It is necessary to understand the historical processes and ideologies that set up the driving forces that created thinking and action that led to the situations we all now face. In *The Unending Frontier*, John Richards sets out to show us some typical examples that explain how human activities across the globe, from about the year 1500 onwards, led to modern environmental/ecological issues.

Richards' basic premise is that four broad processes throughout this historic period were instrumental in changing the environment (a) an increased use of land in frontier settlements, (b) introduced and inadvertent invasions of existing ecosystems by exotic species, (c) the commercial increase of wildlife harvesting, and (d) the search for new energy sources. The book is focused within four sections focusing on regional events or one of the four processes to tie the case studies together.

Part I identifies factors in the story of how social and governmental systems worldwide became increasingly more effective in creating social order and stable economies. This was also a period in which many countries began colonial expansion through war and trade, imposing their worldviews outside their own borders. A second chapter in this section deals with the complexity of varying worldwide weather patterns that affected human settlements and hence human resource needs in an age of increasing exploration and technological advancement.

In Part II, the author uses examples from Eurasia and Africa to show how colonialization by small, yet powerful, seafaring nations and expanding landlocked countries changed the way land was traditionally used. It is here, prior to the industrial revolution of the mid 1800s when the first signs of environmental degradation appeared. "The Americas" (mainly the Caribbean and Central/South America), the topic of Part III, is more than a story of how European colonialization dominated a new world and cruelly extirpated indigenous peoples. This European invasion was also one of introductions of flora and fauna (plants, livestock, and even bacteria) that decimated numerous native species. It also includes intensive exploration and extraction of resources, and the overall transformation of whole ecosystems where even today the ecological consequences are severely apparent.

The final section concentrates on the destructive over-harvesting of wild animals to supply food and fashionable accoutrements. Using examples such as the fur trades in North America and Siberia, and cod fishing and whaling in the North Atlantic/Arctic oceans, the author shows clearly that since the 1500s what had

seemed like unlimited resources succumbed to unrestrictive hunting with the extirpation of many species. The loss of species also decimated the organized management systems that propagated the mayhem—a good lesson in how not to manage the environment.

What is clear from this book is that our modern environmental issues did not just begin in the last few decades. The industrial revolution merely helped humans do faster and more efficiently what practices had already been in place for centuries. John Richards uses varied, and well-documented, case histories to build a convincing picture of human-initiated degradation of the planet that “imposed shattering changes on regional ecosystems around the world” (p. 618). Although indigenous people generally suffered and disappeared, the more efficient industrialized countries over a period of some 500 years simplified many complex ecosystems to fit their own needs. As resources became scarcer, colonization allowed quick adaptation and acquisition of new resources.

Human activities have not always created barren, unstable, or degraded environments, but they have always created major changes. Whether those changes were beneficial or sustainable is understandable when looked at from a historical context of how the changes occurred over long centuries of nations managing resources around the planet.

What makes this book truly important is the emphasis on how the whole world, during the 1500s to 1800s, had created a drive for expansion. Although Europeans may have been major players in colonialism, events affecting environmental stability were a pattern of ‘civilized’ countries everywhere. Environmental degradation is not new to human interaction; for example, Europe and the Mediterranean region show ample evidence of poor resource management over several millennia. The current patterns of degradation have their roots in the behaviors of the Renaissance period.

Through the use of unique case histories, *The Unending Frontier* weaves a fascinating story of human interactions with the environment. This is a well-written text, yet it is long and at times each story seems diluted by grim detail. A brief schematic or overview for each chapter describing the main story would have been extremely helpful and would generate more focus as one plowed through the text. Since the author tried to relate specific case histories with general themes, it is by nature a little disjointed.

Notwithstanding these minor criticisms, this book is an excellent way to understand the modern context of how humans have interacted, and are still interacting, with the environment. Despite the fact that the text is about human-induced changes, it maintains an impartial perspective with the reader being given observations and accounts rather than persuasive rhetoric.

For a K–12 school setting, this text is too complex for students to grasp unless a clear outline is drafted and led by a teacher. Care must be taken so that the complexities are not simplified establishing right or wrong perspectives. It is the historical perspectives that help students understand why certain behaviors toward

the environment exist today and in understanding today's environmental issues and why these issues are difficult to resolve. The text lends itself easily to discussions and debates about resource usage in the past and comparisons with the present. College students will need less guidance, yet a background in world history would help. Otherwise it will need a framework by a course professor to help many students grasp the nuances of the various case studies and the connection from past to present, which is a crucial aspect of this book.

Other adult readers who want to understand world environmental history will find this book illuminating. It is enjoyable to read and highly informative. Having a good map of the world by you as you read will help visualize the magnitude of the human impact on the various areas. *The Unending Frontier* can help everyone gain an understanding of historically formed perspectives on the environment and how they drive modern thinking towards the environment.

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**Stormy Weather: 101 Solutions to Global Climate Change**, by Guy Dauncey with Patrick Mazza. 2001. Gabrielle Island, British Columbia: New Society Publishers. 271 pages. Softcover. US \$19.95/CAN \$27.95. ISBN 0-86571-421-5.

At the beginning of the 21st Century, America stands virtually alone in its denial of the urgency and magnitude of the accelerating pace of climate change" (p. xi). The authors of Stormy Weather stand convinced by the plurality of global scientists that global warming is happening. "We can remain in denial, . . . or we can . . . accept that we are in the danger zone, and use our creativity to lift our civilization to a higher level where it can operate in harmony with nature, not against nature (p. xiii).

This climate issue—more invasive and pervasive than many other global matters—leaves many people wondering what they can possibly do. "To acknowledge a problem which is both inevitable and insoluble leaves one with a deeply disorienting and paralyzing feeling of impotence" (p. xi).

*Stormy Weather* provides strategies for change in a practical, well-documented and referenced book. "The World Modernization Plan . . . combines three global-scale, interactive macro-level strategies that would, if implemented, reduce global carbon emissions by the 70 percent required by nature" (p. xii). Yet such a "macro-level plan requires the participation of the leaders of the world's governments, finance centers and corporations" (p. xii). *Stormy Weather* is for

“the rest of us” (**Author Query: Please provide page numbers**) who seek to address the issue on an individual and/or collective level.

The authors, Guy Dauncey with Patrick Mazza, express a sense of urgency that it is time to act. “We need to make some urgent decisions before the greenhouse gases we are releasing accumulate much further” (p. 2). “If we do not change our direction, we are likely to end up where we are headed” (Chinese proverb, p. 58). In spite of their sense of urgency, they exude confidence that by concerted action we can make significant strides toward reducing the severity of global warming.

The first section of the book is filled with background on the issue. Some of the initial chapters convey a history of the global climate, description of the greenhouse effect, contributing gases, and impacts of climate change. Dauncey and Mazza then investigate energy alternatives, and the political/corporate forces that continue to support large-scale carbon dioxide emissions. Every short, data-packed chapter (the average chapter is two pages) is supported by a full list of resources, many of which are Internet-based for easy follow-through by readers.

They present some interesting evidence and predictions regarding the extent of existing and potential climatic impacts. “In 2000, a scientific cruise ship found open water at the North Pole; the last time this happened may have been 50 million years ago” (p. 16). They note that the 2001 UN Intergovernmental Panel on Climate Change (IPCC) forecast that oceans may raise 3.5 to 35 inches (0.09-0.88 meters) by 2100 and 7–13 meters over the next 500 years. Impacts are already pronounced in Bangladesh, keeping two-thirds of the nation under water for 2 months in 2000. “And this is only the tip of the melting iceberg” (p. 17). However, they contend that the surging tide can be reduced to 0.5 to 4 meters if global warming is halted during this century.

The five major counter-arguments to the “theory” of global warming are included in one chapter. The authors state each argument, then present what they consider to be the overwhelming evidence to “counter” these counter-arguments. Clearly, the authors side heavily with the majority of the world’s scientists: global warming is occurring.

Alternatives to the preponderant use of fossil fuel energy are presented, with a primary emphasis upon conservation. In these chapters, the authors strive to present the total costs on a par with a “cradle to grave” approach and analyze the total share each alternative energy source could provide toward reducing the volume of contributions to global warming. They include realistic precautions—noting the significant social and climatic side-effects—for hydro-power and other energy alternatives. For instance, although hydrogen has been touted as the energy of the future, “the wrong approach will waste the potential of the hydrogen revolution and do almost nothing to slow climate change” (p. 41).

The final 101 chapters (**Author Query: 101 chapters? Is this correct?**) are categorically presented for individuals (the first 10 chapters) and then other groups. These chapter clusters include: Citizen Organizations; Cities, Towns, and Counties; Businesses and Organizations; Energy Companies; Auto Companies;

States and Provinces; National Governments; Developing Nations; and closes with Ten Global Solutions.

The attractiveness or viability of the solutions for individuals will vary with location, finances and circumstances, purchasing energy-efficient appliances, using the sun's energy, and traveling more sustainably or buying green power. Each suggestion challenges the reader to at least be aware of alternatives which reduce carbon dioxide or other greenhouse-contributing emissions. Some require a clear conviction to the purpose and are neither cheap nor "easy."

Similarly, some of the chapters for the organizations, companies, states or nations may provide suggestions that are both practical and inexpensive—bringing dollar-savings over time—such as "reduce, reuse and recycle." Other suggestions require a commitment and an investment in the quality of our environment for decades to come.

On a special note regarding the "Organize a Schools Initiative" chapter, the authors quote from Energy Smart Schools: "Studies have shown that schools incorporating passive solar features, such as daylighting, use less energy, student grades have improved, and attendance is higher" (p. 80). "America's schools spend more than \$6 billion each year on energy, \$1.5 billion of which could be saved by better building design, energy-efficient technologies, and improved operating methods" (p. 81). This chapter also includes specific examples of schools that have invested in solar power, are wind-powered, generate hydrogen fuels and "dig up the concrete" (referencing *Greening School Grounds* which was reviewed in the fall 2002 issue of this journal). The educational references for this chapter are particularly extensive.

Collectively, the solutions in *Stormy Weather* provide a viable opportunity for persons to slow global climate change through action as an individual, as well as through their participation in the school, workplace, or organization in which they participate.

Consequently, *Stormy Weather* serves as an excellent resource for individuals, educators, and anyone interested in taking individual or collective action to address one of the most pervasive and potentially long-lasting global environmental issues facing humankind today.

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