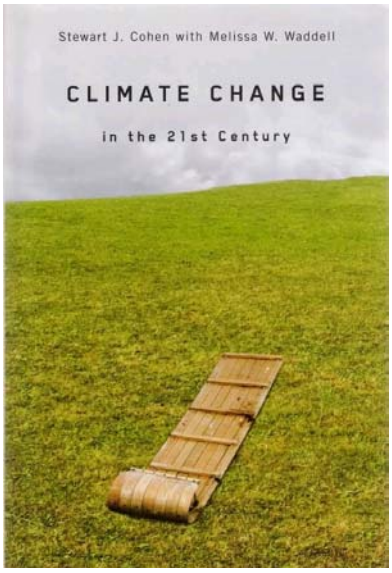
BOOK REVIEWS / REVUES de LITTÉRATURE

Climate Change in the 21st Century

by Stewart J. Cohen with Melissa W. Waddell

McGill-Queen's University Press, 2009
pp.392, 12 tables, 109 diagrams.
ISBN 978-0-7735-3326-4 (cloth), CDN$95.00
ISBN 978-0-7735-3327-1 (paper), CDN$32.95.

Book reviewed by John Hollins[1] [2]



This book is based on a series of lectures for a graduate course given by Stewart Cohen at the University of British Columbia during more than a decade. It draws on a wide range of materials provided to the author by leaders in many facets of global warming, in both the natural and the social sciences. In one sense, it is a textbook that could readily be used by anyone giving lectures in this domain. In another sense, it is a reference work, with a wealth of citations.

Members of CMOS will not be surprised to learn that this book begins with a history of climate research and a chapter on the atmospheric aspects of climate change. These set the scene for the following chapters that address everything from assessment of impacts and potential for adaptation, through economic and social aspects, to climate change in the context of other environmental issues.

The tone of this book is balanced, analytical, and rational; there is not a whiff of the emotion that has been a feature of reporting on the Conference of the Parties in Copenhagen and the reactions of various parties. For the community of professional scientists in atmospheric and oceanographic disciplines working on, or concerned about global warming, this volume offers a broad perspective on the other disciplines that have to be engaged in the development of sound policies and programs to address the fundamental issues identified by them.

The concluding chapter acknowledges that "the global-warming story is woven from a combination of theories, observations, scenarios, and arguments, many of which remain contentious". Despite the uncertainties inherent in understanding the complex biophysical systems being affected by human activities, the book summarizes the aspects that are patently clear: the chemistry of the atmosphere is being altered by human activity; the radiative consequences are beyond doubt; climatic patterns during the past century, while not linear, are real; the cost of extreme events related to weather has been increasing; and there is scientific consensus on some of the scenarios of biophysical impacts.

The book quotes an observation by Kenneth Hare: "*We (natural scientists) desire to export our convictions, but the buyers are reluctant*". A quarter of a century later, some members of CMOS probably feel the same way. Members already know the material drawn from their disciplines in the opening chapters of this book, but the later chapters may offer them insights about the reluctance of the buyers.

[1] CMOS Ottawa Office, Ottawa, ON, Canada.

[2] Stewart Cohen and John Hollins were both members of the organizing committee for the international conference, *Our Changing Atmosphere: Implications for Global Security*, in Toronto in 1988.

Canada's Weather : The Climate that Shapes a Nation

by Chris St. Clair

Firefly Books Ltd, 2009, ISBN-13: 978-1-55407-338-2,
pp.226, CDN$29,95.

Book reviewed by Rob Haswell[3]

Canada's Weather : The Climate that Shapes a Nation is billed as a "book for all seasons" by its publisher, Firefly Books and in that regard it certainly delivers. The bright yellow hardcover with a stick on hologram of lightning screams "school textbook" but I urge you to follow that old adage and not judge this book by its cover.

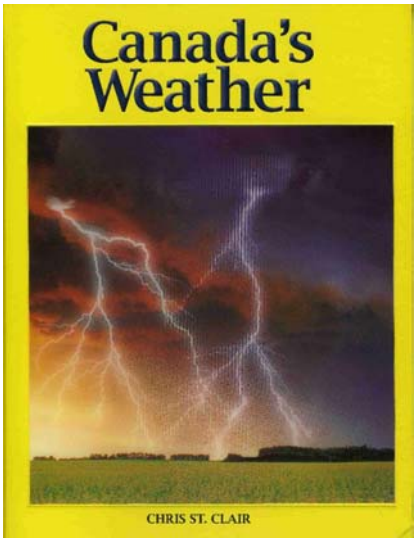
Once you crack open the cover, this book comes alive with some great photos and graphics and does a wonderful job

[3] Fox 6 - Milwaukee, USA. Chairperson, CMOS Weathercaster Committee

of telling the story of a nation and its near obsession with weather. You begin with a beautifully written foreword by well known climatologist, David Phillips, that focusses on our fascination with weather and how it shapes us as Canadians and sets the stage nicely for the rest of the book.

The first chapter is a bit of an echo of the foreword as it again talks about the Canadian obsession with weather but adds some wonderful photos and Canadian weather trivia.

The text then moves on to a thorough overview of how the weather works with the appropriately titled chapter "How the Weather Works". St. Clair starts with the very basics like the water cyle and earth's orbit as it relates to the seasons and then moves into some more intricate synoptic and mesoscale phenomena later in the chapter. With the exception of one or two omissions or perhaps simply over-simplifications like the lack of transpiration in the water cycle, the chapter is very well put together and clearly explains many of the most asked questions about aspects in the study of meteorology.



Happily the clear and concise weather explanations don't stop with this chapter but instead continue into what I feel is the strongest and most engaging part of the book - chapter 3 "The Seasons". This chapter is easily the longest at over 100 pages and breaks down Canadian weather not only by season but also by region. This is a wonderful way to show the incredible diversity of Canadian weather. It begins with Spring and a fantastic photo of a perfect "double bow" over the Magdalen Islands of Quebec and details such regional phenomena as lake-breeze convergence and upsloping snow. As it continues through Summer, Autumn and Winter, we get some great explorations of things like the Northern Lights; Alberta Clippers; Chinooks and storm surge among others. All of the scientific discussion is supported by strong, if somewhat less-than-cutting edge, graphics and great photos ranging from majestic icebergs off Newfoundland to great nostalgia, like a quartet of young Canadians playing street hockey on a cold Manitoba afternoon.

The chapter that follows - "Weather Watching", is also very compelling and takes a look at how we as professionals monitor, measure and forecast the weather for the second largest nation on the planet. It's a nice look at both the physical equipment ranging from the basic anemometer to the less commonly known Campbell-Stokes recorder as well as a look at the data we analyze every day. It goes on to include a bit of weather broadcast history with a look at Canada's TV meteorologist, Percy Saltzman, and a look at the modern weather studios at The Weather Network.

Chapter five takes a look at the harsh reality of Canadian weather by looking at several of the nations worst weather related disasters. The chapter seems oddly organized sorting the disaster stories in no particular order and starting with the Okanaha Mountain Park fire - a disaster that affected the fewest people and smallest geographic area. I think ordering these events by the number of people affected would have made more sense in a book that focusses on the "people" side of the weather.

My overall impression of Canada's Weather : The Climate that Shapes a Nation is very positive. While its school book cover is a negative for the average reader it certainly would make an excellent teaching source and a great addition to school libraries across the country. The book reminds me of the The Weather Book produced by USA Today which was first published in the early 90s. It's wonderful that Canadian weather watchers and school kids alike will now have an all-Canadian source to begin their weather education.

Atmospheric Thermodynamics Elementary Physics and Chemistry

by Gerald R. North and Tatiana L. Erukhimova

Cambridge University Press, 2009, 267 pages, Hardback, US$70, ISBN 978-0-521-89963-5

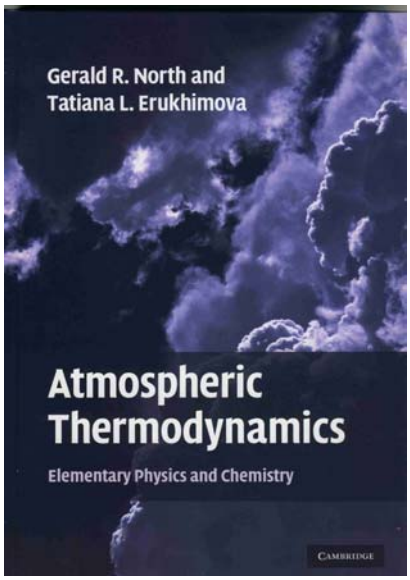
Book reviewed by Henry Leighton[4]

This book is based on lecture notes for a course taken by second and third year students at Texas A&M University and is intended as a text for atmospheric science students.

It starts off with a chapter that, after spending a few pages on units, introduces the ideas of thermodynamic systems and equilibrium. The second chapter presents the ideal gas law but mostly focusses on an introduction to kinetic theory including pressure, velocity distributions and molecular fluxes. The following chapter is devoted to the First Law and adiabatic processes, and introduces enthalpy. Chapter 4 deals with the Second Law, entropy and Gibbs energy. The next four chapters apply the framework developed in the first part of the book to the atmosphere. Chapter 5 introduces measures of the water vapour content of the

[4] Professor, McGill University, Montréal, QC, Canada

atmosphere, the Clausius-Clapeyron equation, lifting of an unsaturated air parcel, and it then goes on to apply the theory developed in chapter 4 to the homogeneous and heterogeneous nucleation of water drops. The following chapter introduces dry and moist adiabatic processes, and the vertical stability of the atmosphere for unsaturated and saturated air parcels. In chapter 7 the ideas developed in chapter 6 are illustrated and expanded with the use of skew T – log p diagrams. Chapter 8 is an introduction to atmospheric chemistry, touching on photochemistry, elementary chemical kinetics, reaction rates and solutions. The final chapter is a lead-in to atmospheric dynamics, starting with some basic vector analysis and ending with derivations of the continuity equation and the thermodynamic equation.



The book is designed to find the middle ground between advanced rigorous treatments of thermodynamics and general meteorology texts which by necessity usually only give a very condensed treatment. For the most part the authors are successful in achieving this goal. The book stands out for its very clear explanations of the concepts and the derivations, and the many worked examples embodied in each chapter that illuminate the theory. The derivations are easy to follow and are complete so students will not have to struggle with filling in missing steps. The chapter on thermodynamic charts is especially well done, including about 20 figures containing thermodynamic charts or portions of the charts to illustrate their uses (e.g. stability and CAPE). However, I am sure that instructors of a course based on this book would appreciate having access to electronic copies of these figures in this chapter. At the end of each chapter there are many problems with answers given in an appendix, a list of the symbols and abbreviations used in the chapter, and a list of other books that complement the material in the chapter.

I intimated that I did not find that the authors were completely successful in finding the balance between elementary text and advanced text. In my opinion the authors were in some places too inclined to explain mathematical details and physical concepts that the readers of this book must be expected to know. To be specific, I was surprised that the authors felt it necessary to include a discussion of basic SI units, to include a table of unit prefixes (nano = 10^{-9} etc), conversions to SI units and relationships between SI units in the first chapter. Students taking a course based on this book must have seen all of this in earlier courses. The tables containing this information could have been relegated to an appendix, and in fact many of the tables are duplicated in full or in part in the first appendix making their presence in the first chapter redundant. Similarly, I found a "Physics refresher" section in the same chapter on vertical motion of a particle and a "Calculus refresher" on the exponential function not only unnecessary but detracting from the flow of the chapter. On the other hand the very clear discussion of thermodynamic systems in this chapter will be appreciated by students. Chapter 2 has some of the same problems as the first chapter. Why is it necessary to define pressure and force units yet again? In an attempt to be overly clear the authors wrote out that "[distance per unit time] = [velocity]" within the body of an equation expressed in words, in such a way as to make the overall equation meaningless. Definitions of velocity or stating $\sqrt{2} = 1.1414$ don't belong in a book of this level. However, I was pleased to find that the following chapters for the most part avoided the earlier problems and were presented at an appropriate level.

In summary, North and Erukhimova's book provides a sound basis for subsequent undergraduate courses in atmospheric science. Equally importantly, they have created a very readable text and taken great care to make the subject as accessible as possible.

Adaptive Governance and Climate Change

by Ronald D. Brunner and Amanda H. Lynch

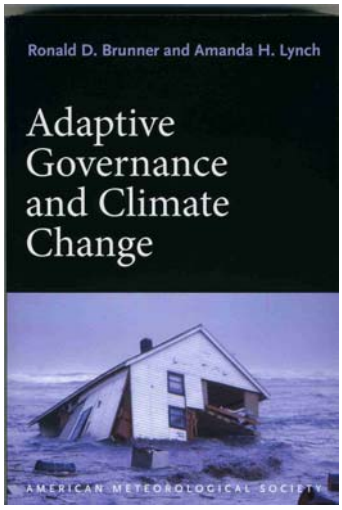
American Meteorological Society
ISBN: 978-1-878220-97-4, 424pp. 2010, paperback
Distributed by the University of Chicago Press, US$35

Book reviewed by Madhav Khandekar[1]

This is one of the latest books on the most intensely debated scientific issue of our time, *climate change.* The book came out soon after the well-publicized Copenhagen meeting in December 2009, organized by the UNFCCC (United Nations Framework Convention on Climate Change) and the IPCC (Intergovernmental Panel on Climate Change). The Copenhagen meeting ended without any substantive agreement on reducing the greenhouse gases (GHGs) which have been identified by the IPCC and its adherents as responsible for recent warming of the earth's surface and subsequent climate change.

The book provides an alternative to the IPCC's approach (on climate change) by suggesting an adaptation strategy, something that is now discussed by many scientists and policymakers. The first two chapters of the book provide a

background on the UNFCCC and the IPCC and the ultimate objective to get an international agreement on GHG reduction. The emergence of *adaptive governance* in recent years at local and regional levels is described as an outgrowth of UNFCCC's unsuccessful attempts to come to terms with developed vs developing nations on GHG targets. The adaptive governance approach is characterized as a 'bottoms up' approach to climate change rather than the 'top down' approach taken by UNFCCC and its ongoing process of negotiating world-wide GHG targets. This approach is further exemplified in chapter three using a case study for Barrow Alaska (located west of the Beaufort Sea at lat ~71N), a small community of a few thousand permanent residents. The climate change impact in Barrow & the North Slope is identified primarily through an intense storm of October 1963 and several other subsequent storms. This chapter, the longest in the book, discusses how the local and regional government initiatives helped develop adaptation strategies to minimize extreme weather impacts. The next chapter of the book provides a framework for developing adaptive governance as a decentralized approach to climate change with community-based initiatives. The last chapter (five) provides a rationale for developing this theme and further summarizes alternative approaches like low carbon technology (e.g., solar electric power plants, wind turbines), geo-engineering (e.g., albedo enhancement by stratospheric sulpher injection) and related initiatives developed in recent years. The last few pages of the chapter are devoted to latest developments on emission targets, failure at Poznan (Poland) meeting in December 2008 on securing any agreement, impact of global economic melt-down and slow recovery, changes in political landscape in the US and subsequent changes in the US Climate Change Action Plans, leading up to the Copenhagen meeting. The book does not discuss the outcome of the Copenhagen meeting nor the failure of negotiations at the meeting due to refusal by developing nations (primarily Brazil, China and India) to go along with any GHG reduction targets being imposed by the western nations.



The book presents a refreshing look at the climate change issue and how to cope with future climate change impacts. This is a significant departure from the IPCC's mitigation approach, which has been stymied so far, due to lack of political will and many other socio-economic parameters. The concept of a simple adaptation strategy is now gaining traction and this book provides a useful background on how this can become more effective and more acceptable in future. It is instructive to note a couple of commentaries on the book: **1.** Prof Judith Curry, climate scientist, Georgia Institute of Technology USA: "*In the wake of Copenhagen, this book couldn't be more timely for those genuinely concerned about climate change and disappointed with the outcome of climate policies to date"* **2.** Prof Mathew Auer, International Environmental Policy, Indiana University USA: "*Brunner & Lynch [book] offer a persuasive alternative to the 'big science, big politics' formula for combating global climate change"*

Besides the example of climate change at Barrow Alaska, the book also provides examples of other locations and regions where climate change impacts are being tackled at local levels. In the Pacific Islands, the PEAC (Pacific ENSO Application Center) informed local decision-makers about impending drought from the intense 1997-98 El Niño and initiated suitable action on minimizing the drought impacts. In Melbourne Australia, amid continuing drought, city officials and other professionals initiated action to make major amendments to local water policies. In Nepal, melted ice water from several glaciers caused significant accumulation of water in a nearby lake. The Government of Nepal, with the support of international donors, initiated a project in 1998 to lower the lake level by drainage, so as to prevent it from bursting and creating catastrophic loss of water and damage to property. These and other examples in the book are primarily geared towards documenting 'global warming' impacts as identified by the IPCC. The reality of recent climate change is however, far more complex and does not conform to IPCC projections. In the Canadian Atlantic Provinces, the mean temperature has been declining for the past 25 years or more and the last ten years have witnessed heavier winter snow accumulation in many locales there. In the conterminous US, the sea-board States in southeastern US as well as some of the mid-western States have witnessed heavier winter snow accumulation in recent years. The past winter saw unusually heavy snow accumulation in Washington, the US Capital, which was paralyzed for almost a week in January 2010, with so many roads clogged with snow! There are many other examples in other regions of the earth which show glaring disparity between IPCC projections and climate reality of the last ten years or more. A discussion on the climate change reality and appropriate adaptive initiatives tailored to specific climate change impacts would have been a useful addition to the book.

Notwithstanding the above minor exclusion, the book is a welcome addition to the plethora of books and documents on environment and climate change that are available at present. This book should be on a "must read" list of decision-makers at various levels of government in Canada. Further, the book could provide a valuable guideline at future national and international meetings on climate change and emission targets. The book's main message that *it is time to take a closer look at adaptation strategy (Plan B)* should now become the new mantra for coping

with future climate change.

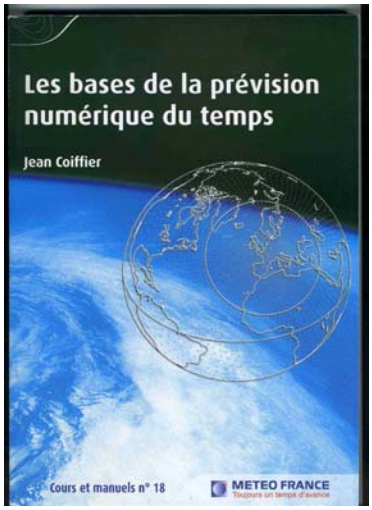
[1:] Madhav Khandekar is a former Research Scientist from Environment Canada and was an Expert Reviewer for the IPCC 2007 Climate Change documents. Khandekar has been in the weather & climate sciences for over 52 years and he continues his research interest at present on climate change issues and impacts on interannual variability of Indian/Asian Monsoons.

Les bases de la prévision numérique du temps

par Jean Coiffier

Cours et manuels No. 18, 2009, École nationale de la météorologie, Météo-France, ISBN 978-2-11-097446-4, ISSN 0240-8996, 255 pages, Couverture souple, 42 € (http://comprendre.meteofrance.com/pedagogique/publications/collections/cours_de_meteorologie/cours_de_meteorologie?page_id=2811&document_id=20861&portlet_id=46724)

Commentaire par René Laprise[5]



Cet ouvrage a pour but d'enseigner aux étudiants des sciences de l'atmosphère les techniques couramment employées pour développer les modèles de prévision du temps. L'emphase est mise sur la description des équations de la dynamique et des schémas numériques de discrétisation, mais on y traite aussi brièvement des paramétrages de l'effet d'ensemble des processus physiques de sous échelle, ainsi que des techniques d'analyse objective, d'assimilation des données et de vérification des prévisions. L'auteur est un expert sur le sujet car il a dédié sa carrière à développer des modèles numériques de prévision du temps à Météo-France.

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[5] Directeur, Centre ESCER pour l'Étude et la Simulation du Climat à l'échelle Régionale Professeur, Dép. Sciences de la Terre et de l'Atmosphère, Université du Québec à Montréal Montréal, QC, Canada

Le premier chapitre brosse un tableau de la courte histoire de la prévision numérique du temps; il nous rappelle que la première prévision remonte à 1950 et décrit les fulgurants avancements des 60 dernières années. Le second chapitre décrit les différentes simplifications qui ont été employées pour alléger les équations et accélérer leur intégration sur ordinateur, ainsi que les diverses coordonnées et projections couramment utilisées. Les chapitres 3 et 4 décrivent respectivement les schémas de discrétisation spatiale selon les méthodes des différences finies et selon les méthodes Galerkin, éléments finis et méthode spectrale. Les chapitres 5 et 6 étudient les effets numériques de quelques discrétisations spatiales et stencils de maillage, ainsi que les schémas d'avance temporelle tels les schémas explicite, semi-implicite et semi-lagrangien, dans le cadre dynamique le plus dépouillé possible, soit les équations de fluide barotrope et en eau peu profonde. Les chapitres 7 et 8 décrivent des formulations de modèles baroclines, hydrostatiques et non hydrostatiques, suivant différentes coordonnées et schémas numériques. Le chapitre 9 fait un survol des paramétrages des processus physiques de sous échelle, et finalement le chapitre 10 traite de l'assimilation des données et conclu avec quelques perspectives pour l'avenir. Depuis la parution du livre, l'auteur a développé une annexe additionnelle où il décrit la formulation de modèles non hydrostatiques pleinement élastiques, en particulier les modèles français AROME et américain WRF; cette annexe fera partie des prochaines éditions du livre.

Ce livre vise la clientèle des étudiants de niveau Maîtrise ou Doctorat en sciences de l'atmosphère, et il suppose une connaissance préalable de la dynamique de l'atmosphère et de ses types d'ondes. Les chercheurs en modélisation, que ce soit en prévision du temps, en climat ou en océanographie, y trouveront une référence fort utile car ce livre fournit des explications détaillées sur les formulations algébriques de plusieurs modèles; ce type d'information est souvent très difficile, voire impossible, à trouver. Le texte réfère fréquemment aux références originales des travaux de chercheurs et le livre comporte une abondante bibliographie sur le sujet.

Le style d'écriture est sobre, le vocabulaire précis, les développements mathématiques méticuleux et bien détaillés. En adoptant systématiquement l'approche de complexité incrémentale, traitant initialement de formulations simplifiées, puis successivement de problèmes de plus en plus complexes, l'auteur a définitivement donné une vocation pédagogique à son livre. Les quelques répétitions que cette approche inévitablement engendre, loin d'être un défaut, seront grandement appréciées par les étudiants qui y trouveront une révision très profitable des concepts qui servira à valider leur compréhension du sujet.

Les modèles numériques deviennent de plus en plus des instruments indispensables dans le domaine des sciences de l'environnement; ce livre permettra à tout étudiant ou

chercheur d'avoir une vue générale sur la modélisation numérique de l'atmosphère et d'apprendre à en maîtriser les techniques. Quoiqu'il soit bien intéressant d'avoir un ouvrage d'une telle qualité en français, une version en langue anglaise permettrait à un plus grand public d'en tirer profit.

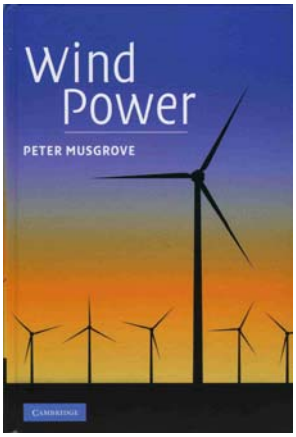
Wind Power

by Peter Musgrove

Cambridge University Press, 2010, 323pp.
Hardback 978-0-521-76238-0, $95.00
Paperback978-0-521-74763-9, $34.99

Book reviewed by Richard Asselin

With a background as an engineering professor, the author joined England's Wind Energy Group in 1988 and became Head of Development of National Wind Power in 1991, a wind farm development company, from which he retired in 2003.



The book starts with an Overview of wind power and our energy needs, followed by 9 additional chapters: The first windmills; Seven centuries of service; Generating electricity: the experimental years, 1887 to 1973; The evolution of the modern turbine, 1973 to 1990; Progress and economics in Europe, 1973 to 1990; UK progress, 1973 to 1990; Development and deployment, 1990 to 2008; and The future: from marginal to mainstream. It is clear, from this outline, that the subject is power, not wind. Indeed, there are three appendices: The power output from wind turbines; The performance of traditional windmills; and Wind characteristics (which is all in three pages!).

The book is well documented, with 50 pages of notes, about 250 references and a 4-page index. It is amply illustrated with about 100 figures and tables, including photos of all types of windmills, drawings of internal working parts, sketches from ancient documents, various statistical or engineering measurements as well as simplified models.

Throughout the book, Musgrove is tedious in his proofs and his analyses of the engineering characteristics and performance of the machines. He carefully reviews the early attempts to scientifically measure the power and energy delivery of mills, especially the power coefficient (the fraction of the wind power that is extracted by the mill). He shows that power of individual mills has increased from about 300 W at the beginning to 3.5 MW now, and that the power coefficient has increased from about 0.005 for the earliest vertical axis Persian mills, to 0.05 for early European horizontal axis mills, and to 0.45 currently achieved by the biggest modern turbines (the theoretical maximum attainable power factor is shown to be 0.59). Early European mills had rotors of about 13 metres whereas the largest turbine has a diameter of 130 metres. These detailed descriptions are a bit long, but interesting form the point of view of the history of mankind's technological developments.

There are discussions about all the mechanical aspects of the mills, from the orientation of the axis of rotation, upwind or downwind placement of the blades, number of blades, speed of rotation, system of orientation, gearing of the transmission, speed control, shapes of blades, material composition, types of towers, etc. There are fewer details about electricity generators, which can be AC or DC, independent or grid connected, using synchronous or induction generators, of fixed or variable speed. This engineering helps to understand the complexity of the process of power extraction from the wind.
Although failures of the early Asian or European mills were never recorded (only successes have been documented), there is a good description of successes and failures in modern times, especially in attempts to scale up earlier models. Some of the failures are indeed humbling!

There are interesting comparisons of the energy output from humans and mills (as well as from early steam engines), for the purpose of grinding wheat, pumping water etc. For instance, a man is said to be able to generate about 60 W on a continuing (8 hours of work) basis. The energy generated by a person is about 175 kWh per year, whereas the average American consumes about 11,000 kWh per year. These calculations may not be that useful, but certainly put things in perspective.

Throughout the book, careful attention is paid to the economics of energy generation, such as capital, operation and maintenance cost of mills, cost per kWh, payback period, return on investment and impact of government incentives. The author offers considerable discussion on the efficiency of various legislative and financial incentives that have been employed in all countries in order to favour the development of wind power. In particular, he deplores the ineffective legislative approach of the UK, compared to the system of fixed feed-in price used in Denmark, Holland, Spain and Germany, or the Production Tax Credit used in the USA. The effectiveness is shown by means of graphs of installed capacity over time for the top 10 countries (among which Canada does not figure).

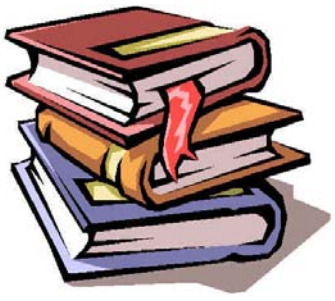
There is a review of the wind energy potential in the world and in a number of countries, indicating that it is a very significant resource. The significance of the adverse effects,

such as noise and visible pollution are discussed and presented as minimal. The problem of intermittency is discussed in terms of its fossil energy cost and economic cost (i.e. when the wind is not blowing, gas turbines have to be turned on). From this analysis, the author concludes that up to 50% of the electrical energy use in the UK, European countries and USA (and probably most countries) could be economically generated by wind power at a cost comparable to the current cost of electricity, but with the additional benefit of a significant reduction in the uses of fossil fuels and CO_2 emission.

I find the mixture of historical, mechanical, hydrodynamic, economic and societal considerations very interesting. The book is factual, easy to read and reasonably unbiased, for example in discussing the nuclear or photovoltaic alternatives. This book is a comprehensive source for anyone who simply wishes to become informed on wind energy, or planning environmental or conservation strategies, and would be a good primer for those contemplating commercial developments. The only weakness that I found is in the description of the spatial-temporal characteristics of the wind, which are summarized in 3 pages at the end of the book. This is very simplistic for a meteorologist, but is apparently sufficient for a wind turbine engineer or wind farm operator.

I certainly feel much better about wind power after reading this book, and in a position to appreciate the initiatives of the Quebec and Ontario governments (and probably others also) in respect to wind power. There are already hundreds of thousands of mills around the world, generating a non-negligible proportion of the electricity. Turbines are being built by thousands of companies in several countries, including developing countries such as China and India. Canada seems to have missed the boat as far as development is concerned.

Books in search of a Reviewer (Partial list)
Livres en quête d'un critique (Liste partielle)



2010-01) *Remote Sensing for Biodiversity and Wildlife Management, Synthesis and Applications*, Steven E Franklin, McGraw-Hill, Hardback, 2010, ISBN 978-0-07-162247-9, pp. 346.

2010-02) *Integrated Regional Assessment of Global Climate Change*, Edited by C. Gregory Knight, Jill Jäger, Cambridge University Press, Hardback, 2009, ISBN 978–0 521-51810-9, pp.412, US$125.

2010-04) *Challenged by Carbon, The Oil Industry and Climate Change*, Bryan Lovell, Cambridge University Press, Paperback, 2009, ISBN 978–0 521-14559-6, pp.212, US$30.

2010-05) *Measuring Global Temperatures, Their Analysis and Interpretation*, Ian Strangeways, Cambridge University Press, Hardback, 2009, ISBN 978–0 521-89848-5, pp.233, US$115.

2010-07) *Ocean Circulation, Wind-Driven and Thermohaline Processess*, Rui Xin Huang, Cambridge University Press, Hardback, 2009, ISBN 978–0 521-85228-9, pp.791, US$85.

2010-09) *Climate Change and Small Pelagic Fish*, Edited by Dave Checkley, Jürge Alheit, Yoshioki Oozeki and Claude Roy, Cambridge University Press, Hardback, 2009, ISBN 978–0 521-88482-2, pp.372, US$155.

2010-11) *The Climate Crisis, an Introductory Guide to Climate Change*, David Archer and Stefan Rahmstorf, Cambridge University Press, Paperback, 2010, ISBN 978-0-521-73255-0, pp.249, US$30.

2010-13) *Water Resources and Environmental Issues, Introduction*, Karrie Lynn Pennington and Thomas C. Cech, Cambridge University Press, Hardback, 2010, ISBN 978-0-521-86988-1, pp.457, US$65.

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