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Masters of Energy

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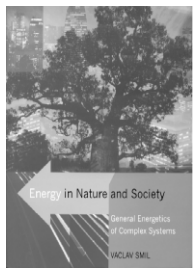
MASTERS OF ENERGY

Energy in Nature and Society: General Energetics of Complex Systems. Vaclav Smil. MIT Press, Cambridge, MA, 2008. 512 pp., illus. $32.00 (ISBN 9780262693561 paper).

A few years ago the American Association for the Advancement of Science presented the Award for Public Understanding of Science and Technology to Professor Vaclav Smil of the University of Manitoba. He deserved it. Smil is one of our more trustworthy guides in an era in which the leaders and citizens of the most powerful societies are stumbling myopically between the exact disciplines that provide concrete answers and the inexact disciplines that provide, or are supposed to provide, less tangible benefits such as beauty, warmth, and wisdom. *Energy in Nature and Society* is filled with facts, measurements, and brief but accurate descriptions of dozens of techniques, which when combined, force facts to make sense. The book is an excellent review for graduates of, say, MIT, whose memory of "energetics of complex systems" has grown dim, and it is a sterling introduction to that subject for those of us who majored in English literature.

Smil situates all this information in the deep soil of humanity's past experience, from the Paleolithic to the present. As a confident scientist he tells us that horses are powerful, people are powerful, atomic energy plants are powerful—and the energy of these wildly different entities can be ranked with the same measurements. Did you know that a healthy man, the biped, is the best marathon runner of all large animals? That is because he sweats so efficiently. Have you ever thought of measuring a human mother's milk for its energy content? See page 126.

This book could supply the foundation for a full undergraduate college course in energetics. It begins with a proper introduction to the subject of energy and to the means by which we measure and analyze its manifestations. The next chapters provide us with a brief outline of the intellectual origins of the field, then acquaint us with the subject on a solar and planetary level, and finally lead us to our planet and the mysteries of photosynthesis, which underlies nearly all known life. Once these formalities are completed, Smil demonstrates how we exploited all the above to make ourselves something new among animals, how we developed agriculture, and how we came to occupy most of the regions of the planet's continents within the last 10,000 years.



Halfway through the book, Smil deposits us teetering on the threshold of the fossil-fuel revolution, whose significance is hard to exaggerate. The difference in modern energy consumption, Smil tells us, "between a subsistence pastoralist in the Sahel and an average Canadian may easily be larger than 1000-fold" (p. 258). Agricultural production has increased enormously in the past century, and my belly is full; in fact, I may have achieved obesity. I have 350 horses parked in my garage, so the air is brown and gray, and I can be sure that summers (and winters too) will be toastier from now on.

Smil is not without emotion as he sketches the current scenario—he obviously cares—but his descriptions and analyses are factual, not hysterical. He doesn't waste the reader's time with scaremongering sermons that the environmentally aware citizen has already heard time after time. He provides excellent summations of what is and is not happening with regard to climate change, and punctures a few bubbly dreams of easy solutions: ethanol is not as energy-rich as oil; we can't plant enough corn to turn into enough fuel to run our societies in North America; and although hydrogen fusion could perhaps solve our energy troubles, for half a century we've been trying—without success—to make it work. Smil suggests we give up assuming that civilization always means increasing consumption of energy.

I wish millions of people would read *Energy in Nature and Society,* but it is not a book one curls up with to read on a rainy weekend. Smil has a fine mind and is well informed, but he doesn't rank with the likes of Steven Jay Gould as a popular science writer. When certain institutions or concepts are mentioned often, he substitutes their initials for their full names, which can be disorienting for a novice in the jargon of the field or for a merely forgetful reader. He makes abstruse calculations without providing smelling salts for us English literature majors. He (mercifully) does provide two glossaries, two indexes, and an extensive bibliography, as well as charts and graphs throughout the book. Even so, this book belongs on the desktop, not on the bedside table.

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