

The Earth's Biosphere: Evolution, Dynamics and Change

BY VACLAV SMIL

viii + 346 pp., 23.5 × 21 × 2 cm, ISBN 0 262 19472 hardback,
GB£ 21.95/US\$ 32.95, Cambridge, MA, USA: The MIT Press,
2002

The subject of *The Earth's Biosphere* is, as the title suggests, an integrated, multidisciplinary description of life on Earth and how it evolved. Beginning with a discussion of the planetary conditions necessary for carbon-based life as they are understood, and the probabilities of these conditions being met in the Universe, the book describes life's diversity and resilience. The energy fluxes that drive life, and the biogeochemical cycles of the elements that both allow life to exist and, in part, are driven by life, are then described and quantified. The extent of the biosphere, its mass and productivity, and its dynamics and organization follow, with a final chapter on how 'Man, alone, violates the established order', as the author so aptly quotes V.I. Vernadsky.

This book will be of interest to anyone with a longing to better understand the world. It is not an easy read, being both broad in its range, and deep in its coverage, but it is a fascinating one. It goes far beyond being merely a qualitative description of the biosphere, but rather attempts to quantify every process and flux, detail every chemical change, illustrate every argument, reference every statement. There is so much here; it is a book to read and to return to.

Vaclav Smil has written many wonderful books, on energy, food production, fertilizers and biogeochemical cycles, and *The Earth's Biosphere* is another such book: wise, thought-provoking and highly informative. It is beautifully illustrated with black and white figures, and supplemented with appendices, a list of relevant web sites and a large and very up-to-date bibliography. How one man can master such a range of published material and integrate it into such an absorbing book is itself a marvel!

NICK HEWITT

Institute of Environmental and Natural Sciences

Lancaster University

Lancaster LA1 4YQ

UK