wrote an essay for a 1993 USDA symposium. This one revisits it and asks whether weed science has 'overcome the paralysis of the pesticide paradigm'. He presents his thoughts through historical perspectives as to why the 'pesticide paradigm' developed, that weed scientists have worked in apparent isolation and a lack of forethought as to the consequences of their output and how societal responses have developed. He asks whether weed science is changing and questioning, or whether the 'pesticide paradigm' remains at its core. Zimdahl also recognises signs of evolution, but that it should go further in understanding weeds and their behaviour and the analysis of risk in technical change for humanity and the environment so that we can use available technologies more wisely.

I suspect that weed science has evolved more in those directions than indicated in Zimdahl's largely US-biased review. Nevertheless, I recommend this to all who wish to consider how weed science could develop; but not only weed science. This is a salutary tale for all scientists – remember that there is a wider world out there!

Ken Davies

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Introduction to Modern Climate Change. By A. Dessler. Cambridge, UK: Cambridge University Press (2012), pp. 252, £29.99. ISBN 978-0-521-17315-5.

This well-written and approachable textbook would also provide a useful book for the interested layperson. It covers the widest range across the subject in a clear and informative way for both science students and non-scientists. Particularly welcome are the sections on policy and political debate and how they link to the science.

The first seven chapters cover the science of climate change in all its various aspects. The last six chapters move through models and emission scenarios, and through impacts, social change and aspects of growth, mitigation and adaptation on to emission reduction policies of carbon credits/cap and trade systems. The final chapter gives a short history of the political debate, and the climate science behind it, and pull together the strands into one particular strategy. Greater consideration of China's role here would have been instructive and useful, as would that of agriculture.

The role and credibility of the Intergovernmental Panel on Climate Change (IPCC) is accepted rather unquestioningly and counter debates and data and the role of scientific partiality are dismissed too lightly in places. More recent work highlighting the increasingly poor fit of models to observed current effects and divergence of global CO_2 levels and temperature are not covered. Nitrous oxides (not even in the index) in both greenhouse effect and mitigation as significant greenhouse gas contributors are worthy of greater coverage. These reservations aside, the book deserves a wide readership.

Keith Dawson

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Organic Fertilisation, Soil Quality and Human Health. Sustainable Agriculture Reviews 9. Edited by E. Lichtfouse. New York: Springer (2012), pp. 352, £135.00. ISBN 978-94-007-4113-3.

This book is an eclectic collection of 11 scientific reviews in crop production and soil science. It follows previous books in the series by covering a range of themes related to sustainable agriculture. Topics range from conservation tillage, to tomato production for human health, to jute biology and cultivation, to organic and mineral fertilisation in Sub-Saharan Africa. For two of the chapters, including one on mineral fertilisation and the use of plant growth retardants in cotton, it is difficult to see any connection with the theme of sustainable agriculture, however broadly defined sustainability may be. Each of the review papers stands alone and there are no summarising or introductory chapters that would link various contributions. The reviews vary in their scope, length and quality. Some suffer from several spelling and grammatical errors, and include a number of relatively low-quality reproductions of black and white photographs. Generally, the reviews provide an up-to-date picture of the state of the art, but mostly remain limited in the extent to which they present novel concepts,

critical assessments of current developments in sustainable agriculture and alternative strategies for future development. However, the book also contains excellent contributions, including a concise review of no-till agriculture in the United States and a comprehensive overview of recent research on the use of by-products from biofuel production as organic soil amendments.

Thomas Döring

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Arsenic and Rice. By A. A. Meharg and F.-J. Zhao. Dordrecht, Netherlands: Springer (2012), pp. 171, £126.00. ISBN 978-94-007-2946-9.

Rice is the staple food for half of the world's population, and consumption of rice is the major exposure route globally to arsenic. Arsenic has many adverse consequences for human health and affects millions of people worldwide. This book explains the sources of arsenic to paddy soils and the various biogeochemical processes and plant physiological attributes of paddy soil–rice ecosystems that lead to high concentrations of arsenic in rice grain. It includes the global patterns of arsenic concentration and speciation in rice, discusses human exposure to inorganic arsenic from rice and consequences for health. It also highlights particular human populations that have the highest rice consumption, which includes Southern and South-East Asians, and also weaning babies, gluten intolerance sufferers and those consuming rice milk in additional geographic locations. The book also contains information about arsenic concentration and speciation in other major crops and some of the approaches for lowering arsenic in rice grain and in the human diet through agronomic management. The book is an excellent contribution to the field, and is clear and authoritatively written with ample figures and tables and an extensive bibliography. It should be of interest to many biological and environmental scientists concerned with the impact of metals and metalloids in ecosystems and their interactions with soil biota and plants, and consequences for crop production and human health.

Geoffrey Michael Gadd

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Lessons Learned from Long-Term Soil Fertility Management Experiments in Africa. Edited by A. Bationo, B. Waswa, J. Kihara, I. Adolwa, B. Vanlauwe and K. Saidou. Dordrecht, The Netherlands: Springer (2012), pp. 204, €139.95. ISBN 978-94-007-2937-7.

Dr. Bationo's work on soil fertility in Africa is usually worth reading, and this short book is no exception. Ten chapters summarise the major findings from long-term experiments conducted throughout Africa, although in this case 'long-term' means anything over five years because of the paucity of sustained experiments on the continent. There are chapters on effects of crop rotation, tillage, alley cropping and cropping systems (including economic and agronomic evaluation), as well as separate accounts of longer term experiments in the sub-humid highlands of Kenya (Kabete), semi-arid Kenya (Machang'a) and semi-arid Niger. The various authors claim that long-term experiments are an important source of evidence for soil fertility decline, and that they provide critical datasets for the development of sustainable management practices; it is unfortunate then that so few experiments last as long as 10 years because of a lack of funding. So what lessons have been learned? The first chapter, which reviews experiments from West, East and Southern Africa, contains the answers. There are six key points but, in short, the message is that the yield decline was common in all experiments even with inputs, but that the best results (in terms of both absolute yields and sustaining yields) were obtained from treatments that combined both inorganic and organic inputs. With such an apparently clear-cut result, is there a need to spend scarce resources on further long-term experiments, or should the money go instead into promulgating these findings and experience? On this the book is silent.

P. J. Gregory