for the benefit of humanity. The authors could thus be excused for the strong bias of this book towards medical sciences with a single chapter dedicated to crops. Nonetheless, it gives an excellent portrayal of the use of new generation sequencing technologies in elucidating genomes of microbes as well their human hosts and how this knowledge is being used in personalized health care. With such knowledge, potential efficacy or toxicity of drugs can be predicted for patients and appropriate vaccines developed for different human races taking into consideration population structure and allelic frequencies of genes involved in the response pathways for the specific drug treatments. In the area of metagenomics, microbial, organismal and genetic diversity associated with humans is captured and this can, for instance, shed light on how our diets affect gut microbiota population diversity and how these microbes contribute towards our physiology, health or disease response. Genomics applications to understand the effects of human activity, such as agriculture, on the diversity of complex biomes and how this knowledge can be used to promote sustainable practices is also presented. The authors rightly point out that most developing countries lack the infrastructural and human capacities to undertake advanced genomics research and that North–South and South–South collaboration should be promoted. Finally, the importance of including genomics in education curricula is emphasized. This book is highly recommended for both students and practitioners of the life sciences.

Baboucarr Manneh

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Metal Toxicity in Plants: Perception, Signaling and Remediation. Edited by D. K. Gupta and L. M. Sandiolo. Heidelberg: Springer (2012), pp. 264, £126.00. ISBN 978-3-642-22080-7.

Toxic metal(loid) exposure in plants elicits complex metabolic and stress cascades. Ascertaining what is a primary, i.e. direct induction of stress responses, from global responses that derive from these primary changes, or from, direct physiological impairment, is a challenge. This book addresses how plants sense metal(loid)s, i.e. the 'perception' and 'signaling' that induce these primary metabolic changes in the plant's physiology when challenged with a toxic element. The 'remediation' in the title is somewhat misleading as it rarely features in the text, and maybe is in the title to try and broaden the appeal? Each chapter is authored by different people, based on expertise, and the text builds to cover the sensing component of the remit through covering topics such as the roles of thiol peptides and oxidative response, etc. to *metal(loid)* exposure. These topics tend to focus more on the mechanisms of such responses, rather than their role in signaling. Chapters on transcriptomics, proteomics and metabolomics approaches are also interesting, but brief and disappointing, not giving a full development to these emerging areas, particularly with respect to next generation sequencing approaches which are revolutionizing biology and will give unparalleled access to signaling pathways.

The cellular responses and consequences of metal(loid) exposure are fascinating subjects, but poorly understood. This becomes apparent through this text. This is not the fault of the authors *per se*, just that the literature in this subject area is fragmented and poorly studied. This text may, therefore, serve as a catalyst and certainly is a useful reference text for those interested, in this subject area.

Andrew Meharg

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Shifting Cultivation and Secondary Succession in the Tropics. By A. O. Aweto. Wallingford, UK: CABI (2012), pp. 200, £75.00. ISBN 9781780640433.

This book's aim is to present a comprehensive ('holistic' is the word used) and worldwide treatment of shifting cultivation and its biological, soil fertility and land use aspects, as well as the prospects for improvement and intensification. Many of today's land use systems, especially in Africa, are directly derived from shifting cultivation and on a longer timescale it may be seen as the mother of all agriculture. It is therefore an important topic and the book brings together a wealth of information from all corners and several disciplines. This is also its limitation. It is impossible to treat so large a subject in all its aspects in 200 pages and cover all aspects adequately. Just a few examples where the treatment falls short: the chapter on climate fails to distinguish

between unimodal and bimodal rainfall regimes, which is very important in West Africa and determines the geographical limits of the cocoa and oil palm belts and the forest fringe. Some conceptual models for vegetational and soil processes and their interaction are discussed, but the author bypasses the attempts in the last few decades to adequately quantify such processes, which can help to predict the long-term effect of soil mining and land use intensification under the fragile conditions of the (humid) tropics. Although important literature sources are missed, the book presents a useful encyclopaedic overview of shifting cultivation in three continents, including current concerns about land grabbing and the dangers of injudicious large-scale land use. The book is recommended as an introductory college text.

Henk Mutsaers

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Europe's Green Revolution and Others Since: The Rise and Fall of Peasant-Friendly Plant Breeding. By J. Harwood. Routledge: London (2012), pp. xviii + 269. £85 (hardcover), ISBN: 978-0-415-59868-2.

Harwood's well-researched analysis of various 'Green Revolution' programmes from 1870 to 2011 summarizes why some failed and others were apparently more successful. Success is largely attributed to public-funded research and development, especially plant breeding which focused on the needs of small peasant farms and developed varieties of crops that were better adapted, more sustainable and higher yielding, than those from the private sector.

This excellent book should be read by all those concerned with poverty alleviation in developing countries, particularly donors, agricultural scientists at the CGIAR centres and those with similar responsibilities at the World Bank, NGOs and like development organizations.

Harwood's arguments are largely based on historical evidence from farms in southern Germany between 1870 until 1945. He demonstrates clearly that peasant-friendly plant breeding was a better model for poverty alleviation than those developed by private sector breeders. However, he admits that both institutional dynamics and politics played a major role in decision-making and the subsequent impact on resource allocation.

Harwood is to be congratulated on his clarity of thinking, particularly in pointing out the contradictory actions of the World Bank and other short-sighted decisions, for example, those taken by Thatcher's government in the early 1980s, in closing PBI at Cambridge, UK.

Two criticisms; maps showing the changing boundaries of Germany during this period and the location of the German plant breeding stations referred to would be very helpful. Finally, the publisher's price tag puts this book beyond the reach of many potential readers.

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Invasive Plant Ecology and Management: Linking Processes to Practice. Edited by T. A. Monaco and R. L. Sheley. Wallingford, UK: CABI (2012), pp. 216, £75.00. ISBN 978-1-84593-811-6.

This multi-authored book aims to show how an understanding of ecological processes can be used for invasive plant management in semi-arid ecosystems. Despite this apparent focus on semi-arid wild lands, the ecological principles outlined by the authors are broadly applicable. Indeed, the book elaborates on how invasiveness of species can be explained by plant traits like dispersal, establishment and response to disturbance, how the environment, and management of the environment, affects invasive plants and how invasive plants in turn affect their environment – mainly the soil conditions – to benefit their own performance. Successfulness of strategies to reduce this performance, argue many of the authors in principle, increases when all these characteristics, processes and mechanisms that render plants invasive, or an ecosystem susceptible to invasive species, are considered. The authors provide guidelines for such successful management strategies as well as for restoration – through revegetation – of ecosystems that are affected by an invasive species. The book is divided in two parts – 'assessing ecosystem processes and invasive plant impacts' and 'principles and practices to influence ecosystem