

Perry's NOTES AND COMMENTS include information on recent exploitation and population extirpation, as well as on the usefulness of each taxon for timber, pine nuts, fuel, horticulture, and other purposes. He also identifies areas where hybridisation and introgression among these taxa may be occurring. The book includes a Selected Bibliography of 141 references to relevant publications, and a good index providing access to information on places, species, and traits.

For those interested in pines, the book is a delightful read. It provides a shopping list both for visits to native pines in the region from northern Mexico to Nicaragua, and for pines from this region that might be useful for planting elsewhere, including the two southern populations of *P. radiata*. The final three chapters are a powerful statement describing the extent, the importance, and the root causes of forest destruction in this region. Jack Duffield's Foreword concludes thus: "It is hoped that this book will assist in the efforts under way to conserve the rich but precarious diversity of the pines of Mexico and Central America".

W. J. Libby

PROCESS MODELING OF FOREST GROWTH RESPONSE TO ENVIRONMENTAL STRESS

by R. K. Dixon, R. S. Meldahl, G. A. Ruark, and W. G. Warren

Timber Press Inc., Oregon. 1990. 447 pages. ISBN 0-88192-152-1. US\$54.95.

Concern over the possible harmful effects of man-induced environmental change on the productivity and health of ecosystems is increasing. The topic of this conference "Forest Growth: Process Modeling of Response to Environmental Stress" (held at Gulf Shores, Alabama, April 1988) is therefore of considerable general interest, with some 120 conference participants providing a mostly North American perspective.

The papers are grouped under five headings covering (1) Metabolism and Growth, (2) Structure and Function, (3) Model Structure and Evaluation, (4) Tree and Stand Growth Modeling, and (5) Modeling Responses to Environmental Stress. Expectations are raised, and often justifiably, as the book includes good review and technical papers covering the topics of light interception, photosynthesis, and growth allocation, and papers of a more conceptual nature addressing the area of model development in forest systems. The book is nicely bound, and includes an index.

There are, however, some important omissions. The word "health" surprisingly is not found in the index, and also hardly features in any of the chapters, yet defoliation, top die-back, and tree death are globally evident signs of ecosystems under stress. Furthermore, while "genetics" appears in the index, none of the chapters provides insights on how genetic variation, which is clearly the basis for any evolutionary response to environmental change, could be incorporated into our thinking.

What lesson did I learn from this book? It is clear that our eco-physiological knowledge is still very limited, especially when questions arise concerning tree health and stress in

relation to the environment. Acknowledging the complexity of the issues, Robert Dixon suggests that answers won't be forthcoming unless integration of research occurs across the disciplines. I wonder, is the rapidly expanding biotechnology field taking adequate note? The world's diverse biota has evolved under often very trying environmental conditions of the past, and must continue to adapt to future environments. To think we have future environments under our control would be a grave mistake.

P. Beets