this kind. The result is comprehensive, well balanced and authoritative. The claim that the volume is a reference book of facts, working methods and vital data in all phases of practical forestry and its important allied fields is fully substantiated. It is well arranged for reference and is provided with a full index. It is not difficult to believe that it took six years in preparation.

Nothing of importance to the American forester seems to have been omitted and each subject is dealt with briefly, but clearly. The Handbook will be found invaluable as a quick source of information on matters handled only occasionally to bring them back to mind with a minimum of research. Its scope indicates the wide range with which the forester may be called upon to deal. Apart from the basically forestry subjects there are among others, sections on aerial photography, wildlife management, communications and mathematics, including—a sign of the times—several pages on statistics.

This is obviously not a book to sit down and read, but the introductory paragraphs to some of the sections are well worth perusal. Among the contributors' *obiter dicta* I particularly liked that in Section 16, Logging, where it states that "Thanks to his professional education (the forester) will think of tomorrow as well as today—not only of silviculture (in which logging is his principal tool) but of labor and management." Another worthwhile point is made in Section 13, Materials, Structures and Facilities, in regard to maintenance of facilities in recreational areas—"Many foresters . . . are today reaping the whirlwind from the seed of rustic appeal."

It must be presumed that the planning committee considered the possibility of a loose-leaf form for this publication and rejected it in favour of the permanently bound form adopted, though it is obvious that such material as yield tables and information about the capabilities of machinery will need amendment from time to time.

—F.A.

THE FORM AND TAPER OF FOREST-TREE STEMS. By H. R. Gray. Institute Paper No. 32. 78 pp. Imperial Forestry Institute, University of Oxford, 1956.

Foresters have long been interested in the "mechanical theory" of tree form, according to which a tree grows in such a way as to meet most efficiently the stresses caused by external forces. The classical exposition is that of Metzger (1893) who deduced a cubical paraboloid stem form. Because practical evidence does not give a great deal of support to the cubical paraboloid, foresters have been cautious about using the mechanical theory as a research tool.

The paper under review shows that, with an entirely plausible variation of Metzger's basic assumptions, the mechanical theory leads to a simple paraboloid as essential stem shape. In practical terms, when sectional area is plotted against height of section, the profile should come close to a straight line—the "taper line"—for the major part of its length. The author has examined a great number and variety of tree measurements, and the evidence amply supports this

theory. The theory explains the deviations at butt and top, and the variations found in big-crowned trees. It predicts a relation between subnormal butt measurements and elliptical cross-sections which has been verified in practice. The mechanical theory is thus well re-established on experimental data.

The use of the taper line as a summary of tree form has important practical advantages; it makes for a simple calculation of volume; it cuts the time required for standing sample tree measurement, and helps to eliminate field errors; the straight line is easy to think with, and simplifies comparisons in research plots.

It is a pity that the author did not, on page 44, take the natural course of expressing sectional area as a function of height, rather than vice versa. This would have led to an index of taper in harmony with general usage, and to a simple statement of the basic result of the theory—that taper is directly proportional to the external force the tree is catering for. Big forces mean rapid tapers.

It will not generally be necessary for foresters to examine the mathematical appendix. Those who do will discover some obscurities largely due to an imprecise use of symbols. The last approximation in this appendix requires more justification than it gets in the text.

While this review has stressed theoretical apects, it must be emphasised that the paper is of considerable practical interest. It will make profitable reading for all who are concerned with the measurement of standing trees, or the presentation and interpretation of research plot data.

E.L.

A WORLD GEOGRAPHY OF FOREST RESOURCES. Edited by the American Geographical Society. Ronald Press Co., New York, 1956. pp. 736. Illustrated. $12.50.

The book is a medley of opinions and statistics, ill-assorted and widely opinionated. Authors range from the highest authorities downwards, to the confusion of the layman and the consternation of the forester. One saving grace is a full index and bibliographical notes. But even this does not get us very far with a lot of the generalization in place of summarization which has occurred.

On the other hand any form of symposium of the magnitude of this subject must pave the way for diverse views and interpretations. There is abundance of both. The first few introductory chapters and the final benediction by Erhard Rostlund make interesting reading, and weld scientifically (and readably) the regional contributions. In many cases these tend to become essays by individuals rather than statements of fact. After all the real value of this work should be to provide comparative information based on comparative facts. In this sense the book has largely failed.

Much of the interest of the regional chapters is centred round the local colour they express. Apart from science and statistics there is a sense of anticipation which makes one wonder what is coming next. For example, chinks in the Iron Curtain reveal gigantic training