Fassett has evidently experienced difficulty in deciding where to draw the line between aquatic and terrestrial. For his present purposes he defines an aquatic "as a plant that may, under normal conditions, germinate and grow with at least its base in water and is large enough to be seen with the naked eye", a definition which must inevitably raise difficulties regarding the selection of species. The author admits that the list is highly subjective and that no two botanists would be

likely to draw up the same list of species. Many of those included are plants of swamps or wet situations by the margins of lakes or rivers. The bog habitat is said to be excluded, though not a few plants find admission which do, in fact, occur in bogs.

An appendix gives a brief but useful statement regarding the use of aquatic plants by birds and mammals, and the volume concludes with a glossary and index. J. R. MATTHEWS.

AMERICAN APPLIED SYLVICULTURE

Applied Silviculture in the United States

By Prof. R. H. Westveld. Pp. vii + 567. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1939.) 25s. net.

THIS book may be regarded as one of the most informative works on some important branches of forestry which has appeared. Carefully prepared for the United States and profusely illustrated, Prof. Westveld's work will well repay a study far outside that country. This is not a treatise on silviculture pure and simple; the word 'applied' in the title is doubtless intended to correct such a diagnosis.

The author divides his book into eighteen chapters, as follows: i. North-east spruce—hardwood region. ii. New England white pine region. iii. Oak region. iv. Allegheny hardwood—pine—hemlock region. v. Southern Appalachian region. vi. Southern Pine region. vii. Southern Bottomland hardwood region. viii. Central hardwood region. ix. Lake States region. x. Douglas Fir region. xi. Northern Rocky Mountain region. xii. Lodgepole pine region. xiii. Southwest Ponderosa pine region. xiv. California pine region. xv. Northwest Ponderosa pine region. xvi. Black Hills Ponderosa pine region. xvii. Redwood region. xviii. South-eastern Alaska. The method of treatment of each of these chapters is on similar lines, as follows: *Description*: Location and land ownership, physiographic features, climatic features, development of lumbering, effect of past practices. *The Forests and their Management*: composition and character, stand regeneration and development, windfall, utilization and marketing problems, growth and rotation, financial aspects, application of silvicultural methods, slash disposal and effects, disease and insect problems, control of animal and logging damage.

Some of the above heads and investigations go beyond the definition of silviculture as understood

in Europe, or, we may add, India, where a correct forestry practice has been in force for nearly eighty years. It might be suggested that even 'applied' silviculture should not include such distinctive branches of forestry as protection and utilization.

The varied nature of the forestry problems the United States have to face is evidenced by the total areas shown in each of the above chapters as occupied by forests, either national forests, forests owned by the individual States, and those in private ownership—from the great lumbering organizations and other forest-owning private bodies and individuals down to the small farm-lot woodlands.

A very rough analysis of areas gives the following interesting figures. Total area of forests and forest lands (the latter of a varying type in degrade) is approximately 601 million acres. The national forests occupy approximately 150 million acres; the forests of the several States approximately 19 million acres, whilst 432 million acres are occupied by the various categories designated as private forests.

The most informative and fascinating parts of the book are the author's treatment of the silvicultural problems confronting United States foresters. The forester in India is well aware that, owing to the diversity in climate, typography, and so forth, silvicultural methods and operations will require different treatment in accordance with the varying conditions and species, etc. The same is true in the United States, with the proviso that conifers (instead of broad-leaved species as in India) cover the preponderating area of the forests, and that lumbering, disastrous fires, and large areas of second-growth forest of very varying uniformity in growth introduce an added complexity to silvicultural values and their study and treatment. Prof. Westveld has dealt with these problems in a most instructive fashion.

E. P. STEBBING.