

information which is generally to be found only in books on agricultural botany. His treatment of osmotic pressure, and the relation between roots and soil, is unusually lucid; so also is the summary of the principles of plant breeding.

A few decades ago it could truthfully be said, for botany at any rate, that we left the Germans to write our text-books for us. That is no longer true (though one wonders sometimes whether we shall soon leave it to the Americans). These three books are ample evidence that the Germans still have a flair for writing text-books. Their books are (surprisingly) not so careful nor so painstaking as some British texts are; but they do a valuable service in checking the fragmentation of botany into isolated and pointless specialisms.

E. ASHBY

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HARVESTING TIMBER IN AMERICA

Harvesting Timber Crops

By Prof. A. E. Wackerman. (American Forestry Series.) Pp. xii+437. (New York and London: McGraw-Hill Book Co., Inc., 1949.) 30s.

PROF. A. E. WACKERMAN, of Duke University, North Carolina, has produced a most useful text-book dealing with the harvesting of the timber crop in the United States. Many of the operations covered are of an engineering nature; and these the author has correctly omitted as pertaining to the domain of the engineer, and also because the age-long methods to which the forester was so accustomed have changed during the past four decades to mechanical devices the designs of which are still changing and therefore would soon become out of date in a text-book. But principally the book has been written for students and to aid the instructor in presenting the harvesting problem in a logical manner. The author hopes that foresters will also find it useful.

In the introduction a tribute is paid to American loggers and to those men who were the true pioneers in the opening up of the United States under some of the severest conditions man has worked under—events which are depicted so well in that American forest classic, the fabulous Paul Bunyan, a heroic mythical logger of the North Woods who, with his big blue ox, Babe, was credited with mighty feats of logging. Those were the high days of the great lumbering of the forests, and the destruction committed was on an enormous scale; its results are now becoming apparent in floods and erosion, loss of valuable top soil in the agricultural lands, and lowering of water supplies.

Modern logging, we are told, is nowadays a much less trying affair, and the timber harvester usually lives in comfortable, well-appointed and modern camps, in many instances with his family. The reason for this permanent accommodation is that instead of the old 'cut and get out' policy the timber land owners are now forced to grow second crops of timber to replace the old ones cut down. Nowhere is this shown more sharply than in the case of the pulp mills. These are expensive establishments to erect and maintain, and must be provided with a constant supply of wood to keep them running. This supply is not all locally grown wood—it could not be. The pulp logs may be brought by railway as much as two hundred miles to the mills. The annual pulp-wood production in the United States alone shows the very great amount of felling required to supply

the mills. In 1870 annual production was 2,000 cords (1 cord = 128 cu. ft.); 1899, 1,617,100; 1920, 5,014,500; 1936, 7,506,100; 1941, 15,400,000; 1946, 17,818,000 cords.

Prof. Wackerman divides his book into four parts. Part 1 deals with timber crops, the development of forest industries in America and the origins and planning of modern timber-harvesting methods; Part 2, the preparation of trees for removal from the forest, the selection of trees, the cutting and felling operations, hewing, peeling and so forth, and the necessary tools; Part 3, the movement of products from the forest, bunching products from the forest, skidding, loading and transportation of the products from the forest; Part 4, the organisation and control of harvesting operations, measurement of forest products, organisation and costs of harvesting operations, records and local practices.

E. P. STEBBING

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NORTH AMERICAN THRUSHES

Life Histories of North American Thrushes, Kinglets, and Their Allies

Order Passeriformes. Smithsonian Institution; United States National Museum, Bulletin 196. By Arthur Cleveland Bent. Pp. viii+454+51 plates. (Washington, D.C.: Govt. Printing Office, 1949.) 1.50 dollars.

THIS series of Bulletins was commenced thirty years ago and is now nearing completion—the present volume being the seventeenth. Every aspect of bird life is dealt with, from the building of the nest to following the species to their winter quarters. In addition, there are paragraphs dealing with the enemies of the different species, lists of external parasites and details of food.

The blue-bird, *Sialia sialia*, is one of the most popular birds in the United States on account of its brilliant colour and cheery notes. To the ancestors from England who founded the Plymouth Colony, this friendly bird was known as the 'blue robin' on account of its red breast and tameness. Though hardy birds, many perish from hard weather and snow storms on their return journey; but there is often another serious drain on the numbers of this bird. One of the author's correspondents describes how she located in one season 174 nests, containing 774 eggs, and out of this large number of eggs only 33.7 per cent young were successfully hatched and left the nest. Domestic cats were responsible for the death of sixty-four adults and young, a boy robbed eleven nests and snakes accounted for the eggs in forty-two nests.

There is an interesting account of the competition between blue-birds and swallows for nesting boxes in certain parts of North America. Mr. B. W. Tucker has contributed admirable articles on five birds on the "British List", which have occurred in Greenland and north-east Canada; namely, the fieldfare, red-wing, blackbird, common wheatear and Greenland wheatear.

The volume is illustrated with a large number of beautiful photographs of nests and young birds. Mr. Cleveland Bent is to be congratulated on the way he has carried out his task. He has produced a very useful work well up to the standard of the previous volumes.

N. B. KINNEAR