

### Classification and Multiplicity of Growth Layers in the Branches of Trees at the Extreme Lower Forest Border

By Waldo S. Glock, R. A. Studhalter and Sharlene R. Agerter. (Smithsonian Miscellaneous Collections, Vol. 140, No. 1. Publication 4421.) Pp. x+294+36 plates. (Washington, D.C.: Smithsonian Institution, 1960.) n.p.

**T**HIS very detailed study of growth rings in the branches of a number of species of angiosperms and gymnosperms emphasizes the complexity of the problem of the formation of growth rings. The investigation, which was made in Texas, was concerned mainly with trees of the forest border or beyond, where conditions may be assumed to be less favourable for tree growth than within the forest itself. Some of the trees showed multiplicity of growth layers, any one of which might extend over the tree or be confined to a larger or smaller area. One branch, known to be four years old, showed eight growth rings and reference is made to trees subjected to intermittent irrigation which had 15 sharply bordered growth layers formed in four years.

The authors found these growth layers to be extremely varied and sometimes had difficulty in distinguishing between the limits of those formed during a growing season and that which terminated the season. In a distinct seasonal layer it is to be expected that the first-formed cells will be thin walled and perhaps larger than those formed at the end of the increment, where the ring may be well marked by the radial flattening of the last-formed cells or, at least, by a distinct difference between the last-formed cells of the ring and the adjacent first-formed cells of the succeeding ring. No criteria were found by which a false (intra-seasonal) ring could be certainly distinguished from one terminating the period of annual growth.

Post-seasonal growth layers were found, that is, incomplete growth-layers produced after the termination of the main seasonal growth, but probably completed before the onset of winter.

Not surprisingly, the authors conclude that ring counts may not be a reliable method of absolute dating and find that frost rings, which could also be induced to form experimentally by the application of dry ice, serve as a more dependable guide.

F. W. JANE

### International Review of Neurobiology

Vol. 2. Edited by Carl C. Pfeiffer and John R. Smythies. Pp. xii+410. (New York: Academic Press, Inc.; London: Academic Press, Inc. (London), Ltd., 1960.) 11 dollars.

**T**HE second volume of *The International Review of Neurobiology*, like the first, is a collection of nine unrelated articles, five of which may be classified as pharmacological. J. Mardones of Chile writes on the addiction of rodents to alcohol; F. W. Schueler of Tulane, on the hemicholiniums; E. J. Walaszek of Kansas, on the cortical pressor-response to epinephrine as affected by schizophrenic serum; E. Costa of Illinois, on serotonin; and A. Herz of Munich, on drugs which influence the conditioned avoidance-response of laboratory-animals. Two articles are mainly biochemical. L. E. and M. R. Hokin of Wisconsin discuss the significance of phosphatidic acid and phospho-inositide in the transport of sodium-

ions across neuronal membranes; and E. Roberts and E. Eidelberg of California, the metabolic and neurophysiological roles of  $\gamma$ -amino-butyric acid. The remaining two contributions are both from the United Kingdom. R. M. Gaze of Edinburgh reviews work on the regeneration of the optic nerve in amphibians; and H. J. Eysenck of London describes methods of assessing the value of drugs in cases of psychological illness. All the articles contain much interesting material, but the pharmacological five are less impressive than the other four because of a tendency to build too large a superstructure of assumption on a necessarily slight base of fact. The volume is once again well produced, with full references to the literature and a good index.

DENIS BRINTON

### The Observer's Book of Trees

Compiled by W. J. Stokoe. Revised edition. (The Observer's Pocket Series.) Pp. 228+12 plates. (London and New York: Frederick Warne and Co., Ltd., 1960.) 5s.

**T**HE Observer's books must be familiar to many. Their size and uniformity make them handy pocket books, and their clarity and arrangement enable easy reference.

This book on trees is a revised edition of that published in 1937. It describes 106 species of the trees and larger shrubs found in the British Isles. Technical terms have been avoided so far as possible, as the aim has been to assist the observer in identification.

There are more than a hundred half-tone photographs, fifty line illustrations and twelve colour plates. These cover the general appearance, bole, foliage, fruit and flower of individual trees, giving excellent impressions at a glance.

One noticeable difference from the original edition is the inclusion of an illustrated guide to 'identification by twigs and buds', which is useful for months when there are no foliage distinctions. Another difference is the newly devised section of coloured plates. These plates, though less beautiful and fewer in number than in the earlier edition, cover far more ground and are of more practical value. Each plate is divided into four or five groups, showing leaf, flower and fruit of fifty-two different trees.

The book has an introduction and two indexes: one classified by families, genera and species; the other alphabetical.

This newly planned edition will be a worth-while purchase for those whose old copies are becoming worn through well-justified use. The price is amazingly low by present-day standards.

B. J. G. MAITLAND

### Clays and Clay Minerals

Proceedings of the Seventh National Conference on Clays and Clay Minerals, Washington, D.C., October 20-23, 1958. Edited by Ada Swineford. (International Series of Monographs on Earth Sciences, Vol. 5.) Pp. ix + 369. (London and New York: Pergamon Press, 1960.) 60s. net.

**T**HIS seventh volume continues the excellent tradition of previous volumes. Most of the papers are mineralogical in nature, and constitute useful advances in our knowledge of clay deposits. There is an excellent review article by W. Parrish on the X-ray diffractometer. An article by L. G. Schutz on quantitative X-ray determination of