## Antarctic Research Series

**Antarctic Snow and Ice Studies**. Malcolm Mellor, Ed. American Geophysical Union, Washington, D.C., 1964. xii + 277 pp. Illus. Plates. $12.

The ten articles presented in *Antarctic Snow and Ice Studies*, volume 2 of the Antarctic Research Series, place major emphasis on the snow and ice budget of Antarctica. Budget computations are complicated by local and regional variations in the rate of accumulation, by destruction of parts of the record as a result of wind erosion, by wind drift off the continent, and by the inability to differentiate primary precipitation from drift. The latter difficulty is due to rapid sublimation changes in the original crystalline shapes. The following authors contributed papers to volume 2: R. L. Cameron; Hiromu Shimizu; J. G. Zumberge; W. Hoffman, E. Dorrer, and K. Nottarp; J. A. Heap and A. S. Rundle; M. B. Giovinetto; Kenji Kojima; R. M. Koerner; J. R. Reid, Jr.; and L. D. Taylor and James Gliozzi. Some of their results and conclusions are briefly summarized in the following paragraphs.

Accumulation statistics are based on stake and pit studies. An innovation in the methods used is the periodic spraying of dye around stakes to provide key horizons. Techniques in pit studies include ink-staining, differential melting by blowtorch, and the excavation of paired pits so that the surface studied is a narrow translucent partition.

Seasonal layers are identified by melt crusts and oxygen isotope ratios. A new technique is that of measuring the concentration of ultramicroscopic particles by resistance changes in the meltwater electrolytes. The particle concentrations appear to be cyclical, suggesting the possibility of a new method of absolute dating.

The accuracy of the budget for the continent as a whole is believed to have been improved by giving individual consideration to the different drainage basins. The conclusion that after the onset of glaciation West Antarctica reached budget equilibrium twice as fast as East Antarctica is an interesting one.

Horizontal strain in the Ross Shelf Ice has been determined by resurveys of strain rosettes consisting of a center stake and three others at distances of 100 meters and forming central angles of 120 degrees. The resurveys provide the basis for an analytical strain solution.

A fabric study of a firn fold revealed maximum preferred orientation of c-axes of ice grains midway between crest and trough, the point at which shear stresses are theoretically greatest. The fabric diagram, however, failed to correspond to observed or theoretical patterns and is believed to indicate "rotation of the stresses relative to the present fold axis."

It is a source of satisfaction to me to note that it is now common practice to return ice specimens from Antarctica to the United States for detailed study. The feasibility of this practice was demonstrated in 1946.

The procedures and factual data presented in this excellent volume will undoubtedly strongly influence future glaciological investigations in Antarctica. The National Science Foundation is to be congratulated for supporting the publication of these specialized studies.

ARTHUR D. HOWARD
*Department of Geology, School of Earth Sciences, Stanford University*

## Botany

**Physiological Basis of Salt Tolerance of Plants** (as affected by various types of salinity). B. P. Strogonov. Translated from the Russian edition (Moscow, 1962) by Alexandra Poljakoff-Mayber and A. M. Mayer. Israel Program for Scientific Translations, Jerusalem; Davey, New York, 1964. 285 pp. Illus. $12.50.

There is a great deal of information on the morphology, anatomy, and ecology of plants that occur naturally on salinized soils but relatively little concerning their physiology. Even less is known of the effects of salt on the physiology of plants that ordinarily cannot tolerate saline conditions. It is to this particular problem that the book *Physiological Basis of Salt Tolerance of Plants* is directed.

Strogonov first considers the question of the nature of the salt composition of salinized soils, pointing out that it is important to know the relative amounts of the various salts present in a soil as well as the total salt content. Thus soils may be classified as sulfate, chloride, or carbonate, or any combination of these three such as carbonate-sulfate, sulfate-carbonate, chloride-sulfate, if these anions predominate. The actual performance of a variety of plants, native and cultivated, growing in salinized soils in the U.S.S.R. clearly shows that the plants responded quite differently, depending on the anion or anions present in the soil solution.

Most of the book is devoted to a description of experiments where crop plants were grown in soils artificially salinized by various salt mixtures. Different structural and functional aspects of the plants were examined, including such factors as the anatomy and morphology of the stem, root, and leaf; transpiration ratio; osmotic properties of the cells; nitrogen metabolism (free amino acid, amines, and diamines); leaf necrosis; and the accumulation of specific toxic components such as putrescine and cadaverine. The microflora of the root zone was also investigated. On the basis of these studies the author concludes that the different salts have a specific metabolic effect, giving rise to compounds not normally found in the plants.

Practical methods for increasing the salt tolerance of plants are discussed in some detail. After describing numerous agrotechnical methods, Strogonov suggests that a plant breeding program might be expected to be successful to some extent.

The book is of value because it makes available a great deal of factual information previously not available in English. The author's views are quite modern and point the way to new methods of attacking the problem of increasing the productivity of saline soils.

G. R. NOGGLE
*Department of Botany and Bacteriology, North Carolina State College, Raleigh*

## The Acetate Hypothesis

**The Biosynthesis of Steroids, Terpenes, and Acetogenins**. John H. Richards and James B. Hendrickson. Benjamin, New York, 1964. xii + 416 pp. Illus. $18.50.

In this book, Richards and Hendrickson have brought together a wealth of information on the biogenesis of the many classes of naturally occurring compounds that can be considered, either by structural analogy or by di-