models and that these models offer only a very qualitative account of the functions.

In chapter two, there is ample evidence of Rouser's meticulous approach to lipid analyses and of steady progress in building up a comprehensive picture of the lipid composition of well-defined membrane preparations.

In chapter three, Luzzati emphasizes the number and variety of alternative arrangements of lipid molecules that can occur in lipid–water systems. These have been established largely by X-ray diffraction studies and the chapter includes useful details on interpretation of such data.

In the fourth chapter, Chapman has undertaken an integration of X-ray diffraction, electron microscopy, spectroscopy and differential thermal analysis data from lipid systems and from membranes. Wallach expertly fills the optical rotatory dispersion and circular dichroism space that Chapman's group has not yet entered.

In chapter five, Dawson renders a valuable service by analysing the experimental conditions required for the interaction of protein with a lipid phase and he considers the relevance of these data to membrane structure. The scarcity of hard facts concerning the interactions that occur in membranes themselves is emphasized.

In chapter six, Lucy examines both theoretical and experimental models and has understandable difficulty in reaching firm conclusions. Most investigators in this field would agree with the suggestion that both globular subunits (protein or lipoprotein) and lamellar formations probably contribute to membrane structure. A dynamic relationship between the two may provide the basis for variations in membrane properties. Opinions differ, however, as to the significance or relevance of most of the experimental data that are invoked as evidence for the occurrence of particular structures in membranes.

In the seventh chapter, Leslie selects those membranes which are involved in energy conversion processes and considers the effects of the molecular organization of membranes on the electronic energy level structure of bioenergetic molecules and on the interactions between them. "Specific organization of the energetic moieties will lead to energetic interactions and energetic potentialities in the organized systems quite different from the isolated molecules." Leslie discusses these differences.

The final chapter, by Singer and Tasaki, is an example of the physiologist's view of membrane activity and its structural implications. It is in the form of a standard paper on excitability in squid giant axons. It features materials and methods, results and a discussion which leads to a theory—the "two-stable-state" theory of excitation.

Chapter one is a brief introduction by Chapman in which he states that his aim was to bring together recent studies of cell membranes, especially physical and biophysical studies, so as to show the progress being made in our present understanding. The result is a very interesting collection of contributions of high quality which achieves this objective.

J. B. FINEAN

SHELL COLLECTING

British Shells

By Nora F. McMillan. (Wayside and Woodland Series.) Pp. xii+196+80 plates. (Warne: London and New York, October 1968.) 50*s*.

SHELL collecting has long been popular, less now, perhaps, than formerly, but still attractive to those with eyes for beauty. To name his finds, however, the collector has often been forced to the century-old books of Jeffreys, Forbes and Hanley, or Alder and Hancock, difficult of access and obscure in language. Less difficult was Step's *Shell Life* with which most young malacologists began study. The latter book in the "Wayside and Woodland" Series has now been replaced by the present volume. It shows a change in the traditional format of the series: the page size has been increased and the plates grouped. Illustrations are partly coloured, partly black and white. The former are mostly very good in their representation of colour values, the latter clear and accurate, though not always provided with scales.

The text contains preliminary notes on collecting, classification and a glossary, and then plunges into a species-by-species account of the molluscs found on and around the British Isles, including the Channel Islands. As the title suggests, the descriptions confine themselves to the shells of prosobranchs, land snails and bivalves with few references to soft parts; these are naturally more abundant where slugs and cephalopods are treated. In addition some indication is given of the distribution of each species and of its geographical range. There are no keys to help the reader and he has to resort to the old practice of looking at the pictures and descriptions to find which fit best. It is no easy matter to make a key for molluscs, for the complex three-dimensional shape of their shell defies easy description in words, but it is a pity none has been attempted. The decision to minimize references to soft parts is unfortunate, too, because some identifications (for example, of the species of *Patella*) are easy when soft parts are used, difficult, if not impossible, on shells alone. The species dealt with are numerous and include many unlikely finds: the problem of where to draw the line in books of this type—whether to include everything or not—is a difficult one to solve. Mrs McMillan has taken a sensible course by dealing with nearly all recorded British species and giving warnings and indications of rarity that seem about right—a few perhaps too optimistic.

Most students and amateurs will find this book a great help in their attempts to identify snails, slugs and bivalves. It is easily carried, easily understood, up to date in names and technical terms and well (sometimes beautifully) illustrated. It is a valuable addition to the conchologist's library and to the series to which it belongs.

A. GRAHAM

WATER RELATIONS IN PLANTS

Water Deficits and Plant Growth

Edited by T. T. Kozlowski. Vol. 1: Development, Control and Measurements. Pp. xi+390. 163*s* 4*d*. Vol. 2: Plant Water Consumption and Response. Pp. xi+333. 140*s*. (Academic Press: New York and London, July 1968.)

THE editor of these volumes has brought together an impressive range of contributed topics which justify yet another publication in this well documented field. Volume one opens with an editorial introduction to the important problems of the subject and a chapter by A. S. Crafts on the structure of water. A whole chapter is devoted to the terminological problem and the writer, S. A. Taylor, presents again the case for a thermodynamic terminology.

Movement of water through the soil–plant–atmosphere continuum is reviewed in three chapters: C. B. Tanner discusses the nature of evaporation and deals briefly with the various approaches to the theory and measurement of evaporative loss; W. R. Gardner analyses the status and movement of water in soils and its uptake by roots, while I. R. Cowan and F. L. Milthorpe consider those plant factors which influence water status and movement in plant tissues.

A single chapter is devoted to drought-resistance (J. Parker) and, inevitably, catalogues a great range of experimental and observational data while drawing attention to our lack of knowledge at the biochemical and cell-physiological levels. The volume closes with