Excelsa. The third number of the journal of the Aloe Cactus and Succulent Society of Rhodesia splendidly maintains the standard that has been set from the start. There are articles for all tastes. The major formal contribution is a check-list and annotated index of *Lithops* (accompanied by coloured illustrations) by D. T. Cole. Other papers deal with *Aloe*, *Cycas*, *Pachypodium* and *Adenium*; there is an extract from Bunbury's Cape journal of 1838, with his observations on some plants of the Port Elizabeth area; and by way of contrast there is a fascinating article on microclimates in relation to plant growth by M. W. Kamstra.

I hope the reading of E. J. Bullock's "Thoughts on the status of Aloe lutescens" will not be restricted to those who are interested in this particular plant. Mr Bullock interweaves with his aloes a philosophy on the important role of the part-timer in advancing our knowledge of plants and on the value of the field observations he can make. I heartily endorse every word of this. As a full-timer may I add that I have received enormous help from Mr Bullock's counterparts elsewhere: people who have roamed their own farms and countryside and know their plants; and who are able to make observations all the year round. These people are first-class naturalists and *Excelsa* is clearly a journal that will help to recruit and encourage them.

B. L. BURTT

Numerical Taxonomy.* The last decade has seen a veritable explosion in the use of numerical methods in science generally and in biological taxonomy in particular. This explosion has been accompanied by an intense debate on the value of such applications to taxonomy. It is fitting therefore that Sneath & Sokal should decide to update their original work first published in 1964. *Numerical Taxonomy* sets out to describe the various numerical methods that are available to the taxonomist and to give the necessary theoretical background so that they can be used effectively. This admirable compendium must surely be considered an essential text for all taxonomists who intend to use or have an interest in numerical methods.

We have learnt to expect an almost messiacal dedication to the subject from Sneath & Sokal. The sceptics will therefore be pleased to find that they have retreated from some of their more extreme views (on, for instance, the use of overall similarity as a measure of taxonomic affinity and the rigid acceptance of phenon levels for different ranks). The section entitled 'A critical examination of numerical taxonomy' is a brave attempt to put the subject in perspective though I am sure that it does not go far enough to satisfy many of the doubting Thomases.

In short, this book is an absolute must for serious students of numerical taxonomy even if they have little or no mathematical background.

D. F. CHAMBERLAIN

* Numerical Taxonomy. The Principles and practice of numerical classification. By Peter H. A. Sneath and Robert R. Sokal. xv + 573 pp. 81 illustr. 9 tables. W. H. Freeman & Co., England. 1973. £9.40.

Shedding of Plant Parts. The concept of this new volume* in the Physiological Ecology series is wholly admirable: it embraces every aspect of the separation of parts from the parent plant. Naturally the centre of the stage is held by the active physiological process we call abscission; but, as Addicott & Lyon point out (p.86), the boundary between physiological and physical causes of shedding is not a sharp one. Therein lies an immediate justification for this wide treatment.

The first chapter, 'Extent and significance of shedding of plant parts', by T. T. Kozlowski, the editor, both outlines his wide concept and gives detail (e.g. seasonal and quantitative aspects of litter formation) on subjects not covered later. Then follow three chapters on the anatomy and physiology of abscission by Barbara D. Webster, F. T. Addicott & J. L. Lyon, and Daphne J. Osborne. These are written clearly and with authority. They cover just about 100 pages, and any botanist who has not specialised on abscission may be really grateful for these. 'Shedding of shoots and branches' (W. F. Millington & W. R. Chaney) is interesting and wide-ranging, even to the extent of recognizing the scars of natural branch-shedding in fossils.

Chapters 11 and 12 concern very practical aspects of shedding: 'Chemical thinning of flowers and fruits' (L. J. Edgerton) and 'Chemical control of fruit abscission' (W. C. Cooper & W. H. Henry). These are good straightforward accounts which show how the physiological and anatomical research is being put to practical use. It is in the intervening five chapters that one is less happy; partly because of bad titling. 'Shedding of roots' (G. C. Head) is to a very large extent concerned with roots of temperate fruit trees; a good survey of recent work is given but such topics as the annual death of the roots of bulbous plants receives no mention. 'Anatomical changes in abscission of reproductive structures' (R. K. Simons) in fact does no more than summarise the author's published studies on four species of *Prunus*. 'Shedding of reproductive structures in forest trees' (G. B. Sweet) refers to trees of forest plantations.

Much of the book is over-referenced, but the situation becomes ludicrous in 'Development and shedding of bark' (G. A. Borger). In the section on periderm (pp. 207–209) there are 43 references: among them three standard text books, Esau 1965, De Bary 1884 and Eames & Macdaniels 1947, occur respectively 16, 13 and 7 times. Two pages later all three of these authorities are needed to support the statement that "The majority of species forming periderm also form lenticels". Unfortunately in all this nonsense one important reference is missing: there is no mention of T. C. Whitmore's detailed studies of the barks of Dipterocarpaceae (New Phytologist, 1962). Nevertheless this chapter does give some useful information. Regrettably the same cannot be said of "The shedding of pollen and seeds" (R. G. Stanley & E. G. Kirby). Whatever fringe information is added, the heart of this chapter should surely be the escape of pollen from the anther (whether as single grains, tetrads, irregular groups, polyads or pollinia), and the severance of seed or fruit from the plant. There is an outline account of the function of the endothecium in the longitudinally dehiscent anther: then we learn (p. 301) "longitudinal and poricidal dehiscence are the two most common forms". But there is no mention of the fact that in Ericaceae, the major family where poricidal opening is normal, there is usually no endothecium and pore formation is by a process of dissolution. Again later (p. 302) there is the remark that the change from entomophily to anemophily "has been correlated with reduction of longitudinal dehiscence patterns and dominance of poricidal opening". This is simply incorrect: anemophilous sedges, grasses, ragweeds, and catkin-bearing trees all have longitudinally dehiscent anthers. Once the pollen is shed its transfer to the stigma of the same or another flower is surely beyond the scope of the title, as is its concentration in the atmosphere: yet these aspects occupy the greater part of the section. It is the same with the section on seeds: a very inadequate account of the actual process of fruit and seed shedding and a much larger section on subsequent dispersal (expensively illustrated by excellent but irrelevant photographs). Here one might surely have expected, in a book where applied aspects are much to the fore, some reference to shattering in cereals and to man's control of both this form of shedding and also of seed-shedding, most recently in breeding indehiscent forms of Sesamum and Lupin.

To sum up, the broad concept on which the book has been planned is attractive, but it is in the peripheral topics that it is at its weakest. Because parts of the book are very good it is worth having, and libraries will certainly need to buy it. But they are being exploited: for what the book really has to give need occupy no more than half the space and as value for the high price (£16.45) it gets a poor mark.

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* Shedding of Plant Parts. Ed. T. T. Kozlowski. 560 pp., illustrated. Academic Press, New York and London. £16.45.