

understanding the principles of separation in relation to the properties of the compounds rather than on detailed methods. The quality of production is high (as is usual with Academic Press), but the rather arbitrary choice of topics and division between volumes

means that it will be of more value as part of a library series than for purchase as an individual volume.

P.R. Shewry

New Techniques of Optical Microscopy and Microspectroscopy; Edited by R.J. Cherry; Macmillan; Basingstoke, 1991; xii + 279 pages; £55.00.

One goal of modern biology is to understand the structure and function of individual molecules, or small arrays of molecules in single cells. New techniques which permit investigations of living cells and which are, of necessity, based on optical microscopy, are gradually superseding the imaging of fixed tissue. This interesting little book brings the reader up to date with what is currently possible and whets their appetite for those exciting images which remain hidden just below the horizon.

Inevitably the sophisticated approaches described have a strong technical element — something never easy to convey in a general text. The opening chapters address such matters with considerable sympathy. They convey the excitement of novelty, last year's fantasy is today's reality! And at the same time do justice to the detailed quantitation necessary to support qualitative observation. Very often in biology new discoveries, which fascinate and excite, are accepted without recourse to rigorous measurement. Enchantment by trinkets is no substitute for a studied understanding of the facts!

The chapters devoted to particular applications differ considerably in quality and interest. Many topics are addressed: nanoparticle video microscopy, microscope laser light scattering spectroscopy, differential polarization microscopy, time-resolved fluorescence microscopy, fluorescence photobleaching, ion content of single cells, imaging of membrane potential. The key is that techniques looking for a problem are much more difficult to present than problems in urgent need of a solution. So if you are not very

interested in haemoglobin aggregation in sickling red cells it is hard to be that enthusiastic about the latest developments in laser light scattering. But surely everybody wants to know about spatial variations of intracellular calcium as well as of membrane potential! On the whole I felt positive about most of the applications especially where the attempts at quantitation were rigorous; hypotheses, good or bad alike, can only develop into theories (which can take a long time) or die on the basis of established facts.

I have two substantial complaints. Firstly the illustrations are very disappointing, it is quite incongruous for a book on microscopy only poorly to reproduce the relevant images. Could not proper plates have been produced as they were in Chapter 10? Secondly the index looks completely out of place. At the end of a pleasantly produced book it is astonishing to find the index in a different typeface, with letters fused to their neighbours making many entries difficult to decipher. The index content was reasonable but its appearance was a strong disincentive to using it to find reference to particular problems.

At £55 I do not think this book will find its way onto the private shelves of many scientists. It is, however, a valuable resource for those contemplating a problem which they think might just have a microscopic solution. It will be difficult to find on the shelves of the library because someone else will always be reading it.

C.L. Bashford

Nonlinear optical techniques which provide vibrational contrast have gained increasing attention in microscopy during the last two decades. After outlining the potential of these techniques, we give a brief introduction to coherent anti-Stokes Raman scattering, stimulated Raman scattering and sum frequency generation and discuss their suitability for contrast generation in optical microscopy. The rapid developments in these fields during the last decade have resulted in many different applications.