

fear of something worse than the sacrifices they are asked to make. Under a threat from outside, as in time of war, people will endure severe privation. But when the threat is from within, caused by strains upon the economic and social system, we just do not know what privations people will be prepared to accept. The danger is that we shall find ourselves on the brink of internecine conflict before we realize that problems about the equitable distribution of food and energy are — as President Carter has fruitlessly reminded the American people — “the moral equivalent of war”.

An outstanding feature of *World Futures* is a discussion of the four options, ranging from ‘big-cake-fairly-shared’ to ‘small-cake-hogged-by-the-rich’, as regarded by people of different political persuasions: conservatives, reformists and radicals. Gribbin gives a good summary of the interaction of these three political attitudes toward his preferred option. He sets out what it might be like to live in a high-growth, high-quality world under

one or other of these three styles of government. The radicals would reach this kind of world through revolution and a phase of dictatorship. Conservatives would see it evolving naturally as more and more people find satisfaction in the share of the cake they get. Reformists would hope to make the transition by a technocratic managed economy which somehow (but how?) would preserve the traditional freedoms of Western democracy. Under all styles of government there would be an alarming increase of unemployment which would euphemistically be called leisure. And this is the sixty-four dollar question for all studies about the future: how to replace the work-ethic of the nineteenth century by a leisure-ethic for the twenty-first century. One of the essays in *World Futures* does ask the question. No one yet has provided a credible answer. □

Lord Ashby is Chancellor of Queen's University, Belfast, and a Fellow of Clare College, Cambridge, UK.

Advice on techniques in IR spectroscopy

M.A. Ford

Applied Infrared Spectroscopy. By A. Lee Smith. Pp.336. (Wiley: New York and Chichester, UK, 1979.) \$38.30, £17.40.

THE concept of this book can best be described by using the author's own words: “It is a volume based on practical experience, stressing the fundamental concepts and limitations of analytical IR spectroscopy for the chemist”. Reference to “the chemist” is important, as a reasonable knowledge of chemistry is assumed. And the “practical experience” is very apparent, as there is wealth of advice on good spectroscopic techniques and the avoidance of pitfalls.

The main chapters cover instrumentation, sampling techniques, qualitative applications and quantitative applications with — rightly — by far the greatest emphasis on qualitative aspects. There is also a short chapter entitled “Spectroscopic Literature” concerned with collections of reference spectra and retrieval systems.

Instrumentation is described very adequately without going into excessive detail and the chapter includes descriptions of all the less common types of spectrometer, for example, Hadamard transform, as well as ‘conventional’ ones. Very useful advice is given on “optimising the spectrometer variables” and “performance tests and spectrometer calibration”. There are two small points on

which I would take issue with the author; blazing a grating increases the intensity at a certain angle of incidence rather than “in a certain order”, and noise and signal: noise ratio are more conventionally spoken of in terms of a notional peak to peak noise rather than the RMS value.

In the chapter on sampling techniques, the extent of the author's practical experience is very obvious and even a well experienced spectroscopist is likely to pick up some useful tips. Some techniques are, of necessity, covered only briefly but the reader is always referred to the relevant publications in the excellent bibliography.

A large part of the chapter on qualitative applications is devoted to a good general introduction to the theory of IR absorptions and the concept and use of group frequencies. Interpretation of spectra is covered relatively briefly but, again, there are full references to the available literature and there is much good advice. In addition, extensive correlation charts and lists of characteristic group frequencies are given in appendices. There is also a short description of typical applications.

The final chapter on quantitative applications emphasizes the need for good experimental technique — and very good advice is given — and the need to know “how precise the determination must be”. There is good coverage of all commonly, and most less-commonly, used methods and again a full bibliography is given.

Overall, this is an excellent book which can be strongly recommended to both new and experienced IR spectroscopists. □

M.A. Ford is Technical Director of Perkin-Elmer Limited, Beaconsfield, UK.

Catalysis at work

V. Gold

Enzymic and Non-Enzymic Catalysis. Edited by P. Dunnill, A. Wiseman and N. Blakebrough. Pp.250. (Ellis Horwood: Chichester, UK. Distributed by Wiley: Chichester, UK, and New York, 1979.) £19.75, \$50.

IN April 1978 the Microbiology, Fermentation and Enzyme Technology Group of the Society of Chemical Industry initiated an international gathering of biochemists, chemists and chemical engineers. The purpose of the meeting was a discussion of topics of common interest in the general field of catalysis by enzymes and enzyme-like materials, especially the status and industrial potential of stereoselective catalysis. The volume under review contains a full account of the proceedings, including a verbatim record of about 20 pages of more or less ephemeral discussion remarks. Its nine chapters can be clearly divided into two groups. The first group is devoted to biochemical and chemical studies, and the second to the design and performance of catalytic reactors. One hopes that the meeting produced much mutual education of and by the two groups of participants. The industrial exploitation of the remarkable effects of enzymes and the simulation of enzyme-like catalysis by synthetic materials represent tremendous challenges of potential industrial importance. This message is rather well conveyed by the volume. Of course, things have not stood still in the period since the meeting, and fuller or more up-to-date reviews of some of the topics are available elsewhere. The publication of the book will nevertheless have been justified if it succeeds in creating a greater appreciation, in universities and industry, of the promising possibilities in this area of endeavour.

The scope of the book is by no means comprehensive, and its content is fairly well reflected by the following, sometimes paraphrased, chapter headings: present knowledge of enzyme catalysis (A.R. Fersht, 12 pages); current status of enzyme technology (P. Dunnill, 22 pages); enzymes in organic synthesis (J.B. Jones, 27 pages); enzyme analogues, mostly of the crown ether type (J.F. Stoddart, 25 pages); micellar catalysis (J.M. Brown *et al.*, 17 pages); performance of non-biological catalyst reactors (R.E. Goddard, 42 pages), and of enzymic reactors (J.-M. Engasser, 26 pages); asymmetric homogeneous catalysis (D.J. Thompson, 17 pages); polymer-attached homogeneous catalysis (R.H. Grubbs and S.-C. H. Su, 12 pages). Most of the chapters in this very attractively produced volume include informative lists of references. □

V. Gold is Professor of Chemistry at King's College, University of London, UK.