description of the role of sulphur dioxide in sausages and includes full descriptions of analytical methods for free and total sulphur dioxide.

Non-plasmidic resistance mechanisms are considered in the penultimate chapter. This is a good introduction to the subject and emphasises the fact that laboratory nutrient broth-grown cells are unlikely to replicate the conditions of cells found in natural habitats.

The final chapter draws attention to the effect of dilution on biocide activity and the problems this can cause in comparing biocides.

In all, this book presents an exhaustive survey of the uses of biocides and of testing procedures in the pharmaceutical and certain other industries. Food industry applications receive relatively little space but, nevertheless, the book is useful since the longer history of biocides use in other industries means that they can offer many lessons for food industry users, especially regarding the problems and pitfalls of biocide testing.

J. D. Owens

Common Property Resources: Ecology and Community-Based Sustainable Development. Edited by Fikret Berkes. Belhaven Press, London, 1989. x + 302 pp. ISBN 1-85293-080-2. Price: £32·50.

'Natural resources the world over are being degraded because of direct overuse such as excessive exploitation and because of indirect abuse through pollution, habitat destruction and so on. This has been apparent to informed observers for over a century. Degradation has become more intensive and widespread because of increasing more powerful techniques with massive impact on and deep penetration of ecosystem processes; concentration of the demand for resources and of power to deliver them in distant "technically advanced" centres; and saturation of use and abuse of ecosystems to the extent that vast ecosystem slums result. A large proportion of the world's population suffers the consequences of such degradation. Some partial or local corrective measures have been undertaken successfully but at the levels of regions, continents and the globe, degradation has been intensifying on average and in total'. This quotation from Chapter 7 (Reforming the Use of Natural Resources) summarises the environmental problems the world faces with respect to its renewable resources, forests, pasture lands, wildlife, fisheries and water.

The theme of the book, which runs to sixteen chapters written by twenty-one authors, is not only that development must be sustainable but that that goal can be achieved through communal ownership. Evidence to support this claim is partly historical (see in particular pages 50 and 51), it being argued that joint tenure was both 'natural' as well as the one best fitted to produce sustainable rates of resource exploitation. However (page 151), the

growth of market economies has changed value systems; population growth, technological change and increasingly bureaucratic modes of administration have continued to break down traditional common property systems.

Some examples of communal ownership and use systems have survived and some have even been recreated after breakdown. Almost one half of the book is devoted to case studies of successful communal ownership and resource use. From these and other cases are distilled the guidelines to be followed when establishing communal arrangements. First, there must be the possibility of excluding non-owners, then, rules to govern the allocation of benefits which will, in turn, be dependent (page 11) on livelihood security, access equity and conflict resolution, mode of production, resource conservation and ecological sustainability. The outcome will be sets of arrangements incorporating a proper sense of stewardship under local control, operating under a viable set of user checks and balances.

Insofar as such arrangements ensure that the nominated group bears all the costs of the decisions they take, in pursuit of the gains the resources yield, then they accord with orthodox economic efficiency criteria. 'Natural resource policies can be considered economically efficient if resource consumers are charged the full amount of the economic losses borne by society because of the consumption of these resources' (Marginal Opportunity Cost, MOC, page 151). Furthermore, 'a price less than the MOC would stimulate natural-resource consumption in excess of the economically optimal level'. On the communal ownership terms postulated, given there is no open access to the resource and that externalities are indeed internalised (borne by the beneficiaries), such ownership can ensure proper (sustainable) resources use. But then, so it can be argued, will private ownership, given a properly operating legal system. Moreover, private ownership is much more popular with governments (page 52); but that is much of the trouble. Nevertheless, a further serious problem remains, market motivation by virtue of its openness operates on the basis of higher discount rates than communal ownership; this leads to lower valuation of the needs of future generations and excessive short-term exploitation (page 36).

However, can the principles of communal ownership be applied regionally? Or even globally? Two formidable difficulties stand in the way. First, there is the need to identify and, so far as possible, quantify the totality of external costs (a problem on which society has so far failed to bring the full measure of its scientific knowledge to bear); second, there is the need to create institutions which are capable of internalising those costs; the equivalent of some sort of international ecological police force with powers to inspect, apprehend and punish. But, until we think in world citizenship and community terms we shall, many will fear, lack confidence in society's

ability to solve the problems so clearly set out at the beginning of this review. The authors of this book share these fears for (page 15) they write cautiously 'alternative models based on more complete theory... could provide the basis for sustainable use of common property resources for the future'. It is some consolation that the problems now command such wide interest, an interest which this book will help to inform and to expand.

Alan Harrison

Studies in Natural Products Chemistry. Vol. 3. Stereoselective Synthesis (Part B). Edited by Atta-ur-Rahman. Elsevier, Amsterdam, 1989. x + 540 pp. ISBN 0-444-87298-1. Price: US$165·75.

This is the third book in this series to appear in the last year, and is part of the growing trend of multi-author, camera-ready publications. Often this type of approach leads to an unevenness in the quality of the reviews and in the manuscripts that are reproduced. Most of the fifteen chapters in the present book are of a high scientific standard and all are well reproduced.

Certainly the first very long chapter by Hudlicky is very welcome, as he provides a timely review of the methodology for the formation of fused five-membered ring systems, including all of their own work on the triquinanes, etc. The other very long contribution (by Boger and Coleman) provides an account of the various approaches to the potent anti-tumour agent CC1065, and some of its analogues, and includes information about the mode of action of these compounds.

Many of the remaining chapters describe synthetic methodology that has been employed for the synthesis of natural products. These include the stereoselective Michael reaction, applications of sigmatropic rearrangements, thermal and photo-cycloaddition reactions, the use of arynes and recent developments in carbohydrate chemistry.

Other synthetic chapters include one on new methods for the formation of biologically active lactones (by Jefford), and a formal total synthesis of colchicine (by Wenkert) complete with full experimental details! The final chapter is as timely as the first one, and gives the first full account of the chemistry of the Chinese anti-malarial called qinghaosu.

There is much of interest in the book, and the editor Atta-ur-Rahman is to be congratulated; but given the extortionate price of the book, I doubt whether many individuals will purchase it. In addition, much of the information can be found in the reviews that appear in the Royal Society of Chemistry's 'Natural Product Reports', which libraries are more likely to buy.

John Mann