
CAMBRIDGE STUDIES CONTINUED
Process Development in Antibiotic Fermentations: C. T. Calam.

Cambridge Studies in Biotechnology 4 Cambridge University Press, 1987; ix+217pp; HB £30, \$54.50; ISBN 0521 30490 3.

The series of Cambridge Studies in Biotechnology is not - so far - a particularly long one, but it is conspicuous for quality, and this new title does not depart from the precedent set by the first title, J.S. Hough's "Biotechnology of Malting and Brewing", being directed very precisely towards the serious student at exactly the level he or she should be studying-and that means anyone who is ready to acknowledge that there is still something to learn when a real expert offers a prepared account of an expert's experience and considered judgement. From an experience of antibiotics fermentations that is virtually as old as the topic itself, Calam has put together just such an account. He has arranged the subject of process development under three main headings: background, laboratory studies, and industrial and pilot plant operation; however this is for convenience only, since at all times both the "background" and the real objective of having a real process running in a real plant are kept very much in mind.

This makes for some unusual and invaluable reminders. For instance, the section on "background" includes an account of isolation methods and media as well as the expected accounts of relevant aspects of microbial physiology and biochemistry; the latter are discussed just sufficiently to allow real examples from antibiotics fermentations to be used, and this leads to a very early introduction of fermentation kinetics and to various topics which a less experienced author might be afraid to deal with, like 'inoculum quality' which as Calam so rightly says "may seem rather irrational but they do, in fact, seriously affect antibiotic fermentations in some way or another".

Similarly the section on "Process Development in the Laboratory" is healthily realistic, never losing sight (as the Laboratory's occupants so frequently do) of what the process development laboratory is for. Consequently it contains some very useful accounts of how to record and present data, how to extract sufficient information from the experiments already carried out, and how to decide what to do

next by continuous reference to the most appropriate objectives at different stages in a programme. The laboratory worker will also have to refer repeatedly to the subsequent account of what can be done in pilot and full-scale production units, and of how to decide, from production records, what (if anything) needs to be taken back to the laboratory.

Formal courses in process biotechnology or bioengineering usually have a substantial proportion of "case study" material; Calam's book is in effect an extended case study covering the whole range of antibiotics fermentations and a lifetime of varied experience, from how to isolate an organism to how to decide to terminate a low-yielding run. It is a very personal book, with a lot of points in it that the author would surely agree are arguable-but how instructive to have the opportunity of hearing his side of those arguments. Anyone who has sat through meetings where the scientists and engineers concerned with different bits of process development are supposed to be putting their results and ideas together will have spent a considerable part of the time listening to perfect examples of how not to do it, and might be glad to read bits of this book on the way home.

Economic Aspects of Biotechnology: A. J. Hacking

Cambridge Studies in Biotechnology 3 Cambridge University Press 1987; ix + 306; paperback £12.95, \$19.95; ISBN 0 521 34681 5.

This is the paperback edition of number 3 in the Cambridge series, which appeared in hardback in 1986. It is an excellent text for advanced students in "science/technology policy" because - for a change - the science and technology are entirely sound and the discussion of the economic contexts for biotechnology recognises their complexity and the essential facts of how circumstances can alter cases. For the student of biotechnology itself, the careful and very clear explanations of economic aspects will take him to quite an advanced level that develops both decision-making and costs analysis methods. Invaluable at virtually any level.