

approach is described in the chapter by Khmel'nitsky and co-workers, which covers the generation of solution-phase libraries of organic molecules using enzymatic reactions and microbial transformations of existing leads.

As one would expect, the majority of the book covers the methodologies of solid- and solution-phase combinatorial chemistry: synthetic methodology, analysis, automation systems and design/planning software. I particularly enjoyed the chapter by Russell and coworkers covering the use of FTIR spectroscopy in the analysis of resin-bound compounds. Part of this work involves the use of deuterium labelling; the C-D stretch frequency, which is well separated from other vibrations, can give an accurate picture of the progress of solid-phase reactions.

Most of the chapters are well written and nicely structured, the synthetic chapters in particular; perhaps they benefit from the greater freedom of style allowed in a book compared with many journals. Given that each chapter has different authors, there is

surprisingly little overlap between them, save the odd introductory paragraph or two – a compliment to the editors.

Although not a complete 'Who's Who' of molecular diversity, many of the major players in the field have contributed chapters to this book. To those with a little knowledge of the field this nicely presented book offers an appealing way to gather more information. However, for understandable reasons, books of symposia, and this one is no exception, do not offer much in the way of advice about the strengths or weaknesses of different approaches. For this, the only substitute for personal experience is to talk to others – perhaps this book could be your airport lounge companion *en route* to the next conference.

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Outsourcing in the Pharmaceutical Industry by Patrick Taaffe, Financial Times Pharmaceuticals and Healthcare Publishing, 1996. £325.00 (100 pages) ISBN 1 85334 613 6

Timely and informative, this report represents one of the first dedicated publications on the topic of outsourcing, although presumably it will not be long before others reach the booksellers' catalogues. The report stretches across the myriad operations involved in pharmaceuticals, including well-delineated sections dealing with R&D, sales and marketing, and manufacturing and distribution. The layout of the report is well set out in the 'Contents' section, but this reader would have found an index of great help.

Despite the rapidly increasing interest in outsourcing, the author makes it clear that it is not new to the pharmaceutical industry. In the area of distribution in particular, outsourcing has operated in one form or another for many years, because of the fragmented individual systems operating in different countries. The incursion of this strategy into other areas of pharmaceutical operations is clearly due to the pressures from pricing, regulatory authorities and from increasingly difficult therapeutic areas for which a medical need remains. Taaffe mentions that these pressures have forced an inward examination within large pharmaceutical companies on what is their core expertise. This, he says, has often been identified as 'Discovery and Distribution', or 'D & D'. However, this analysis is clearly at odds with the historic prevalence of outsourced distribution networks, and with the tremendous increase in innovation as a target for outsourcing to the biotechnology and academic sectors in this decade.

Perhaps Taaffe attempts too much, given the differing reasons for the outsourcing that has taken place in the different areas of the pharmaceutical industry, and the result is a potpourri of generalities with no clear messages that apply to all areas. For instance, there is clearly a great difference in the strategic input that can be expected from a technological expert in genomics, compared with one who provides a complete research programme, or even an in-licensed product at the end of Phase I. These providers are lumped

into the category of biotechnology, but the pharmaceutical business analyst, for whom this report is ideally suited, will remain confused by the lack of separation. Although published in late 1996, the rapid change in this area means that some remarks have been overtaken by events; readers will note that this report was written before the merger of Elan and Athena Neurosciences, and the name change of Coming to Covance.

These criticisms aside, the report is to be commended for its coverage. Few commentators can provide such a broad overview of the operations of the industry. In its conclusion, the report offers comparisons with the motor industry, and the extensive outsourcing that that industry has had to undergo as a result of the pressures it has suffered in the past decade. The role of the car component supplier is to be compared with that of the outsourcing provider, namely an expert who may supply multiple clients. The 'just-in-time' philosophy has brought about a minimization of fixed costs in much the same way that outsourced clinical trials offer a conversion to variable costs in the pharmaceutical industry. It is the roller coaster cycle of demand for resources that is one of the major drivers for the outsourcing of clinical trials or manufacturing. The utilization of 85–90% of capital manufacturing resource in the motor industry compares favourably with the figure of 60% in pharmaceuticals, and suggests that there is fat still to be trimmed from pharmaceutical manufacturing operations.

This report is written for business analysts, but some of the messages are of relevance to a wider audience. It is therefore unfortunate that, at a price of £325, it seems unlikely that it will find its way onto bookshelves of those with less than a dedicated and specific interest.

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