

**Research and Development in the Chemical and Pharmaceutical Industry, Peter Bamfield. , 3rd ed., Wiley-VCH Verlag GmbH & Co., Weinheim, Germany (2006). 288 pp., Price: US\$ 100.00, ISBN: 3-527-31775-9**

Research and development is defined by the author as “The invention and development of products, processes, systems and services which will provide the company with a commercial opportunity.” To illustrate the never ending changes in the industry (in search of such opportunities), the author gives interesting details on the merger of several pharmaceutical companies (for example, Pharmacia, Upjohn, and Monsanto formed Pfizer Inc., in the period 1995–2000).

The amalgamation of these companies was part of their search for new products. Keys to that search are the R&D personnel. At the end of the chapter, the author writes:

“By the end of this book the reader should understand the principles inherent in running a successful R&D organisation in any of the sectors of the Chemical, Pharmaceutical, Chemical Biology and allied industries. This will include knowing the requirements for harnessing the human resource, organising the environment for a climate of creativity and then managing the resultant innovations through to success in the market place.”

Following the introduction are 12 chapters divided into four main sections:

Section A: Harnessing the human resource

- Building the scientific skills base of the group;
- Developing the people who form the skills base;
- The R&D team manager.

Section B: Organising for an innovative environment

- The structural components of an R&D organization;
- The provision of appropriate support;
- A financially sound, healthy, safe and quality environment.

Section C: Creativity and innovation

- Creativity and the nurturing of innovation;
- The protection of intellectual property;
- The exploitation of opportunities.

Section D: Project management of innovation

- The selection and evaluation of R&D projects;
- The innovation chain;
- The project management skills.

To begin the second major section of the book (Organising for an Innovative Environment), Bamfield writes: “The environment in which research operates has changed over the last few decades with an increasing speed.” Indeed, it does and, at times, not to the benefit of some employees. As I reviewed this book, Pfizer announced a 10,000-person reduction in its staff. Competition in the industry is fierce and according to the author of

this book, “The globalisation of R&D means that an additional set of managerial competencies is required. Outsourcing is now an essential component of business strategy having implications for the management of R&D.”

Creativity and innovation are essential components of a successful organisation. But both are easily stifled or destroyed by poor management. Creative thinking and generation of ideas need to be stimulated at both the individual and company levels. The creation of an aura of “total creativity management” is thoroughly reviewed in the third major section of this book.

I was intrigued by the discussion of an innovative Russian concept of problem-solving entitled TRIZ which is based on their theory of inventive problem solving. TRIZ is very different from other creativity techniques in that it operates via a study of patterns of problems and solutions and not by the spontaneous creativity of individuals and groups.

The final section deals with project management of innovation. The selection of innovative projects is essential for a company’s competitive position. Thus, there is a need for clear definition of innovation to be included in the company strategy.

This is a very interesting and well-written book from my limited perspective. Never having been in an industrial research environment (save for one summer as a student) I am totally unprepared to critically review such a book. However, I am prepared to critique and appreciate good writing, and this text has it. My feeling is that this book will be well received by those truly knowledgeable in the field of industrial research.

G.F. Bennett\*

*University of Toledo, Department of Chemical and Environmental Engineering, Mail Stop 305, Toledo, OH 43606-3390, United States*

\* Tel.: +1 419 531 1322; fax: +1 419 530 8086.

*E-mail address: GaryDocbenn@aol.com*

17 February 2007

Available online 3 March 2007

doi: 10.1016/j.jhazmat.2007.02.065

**Quantitative Analysis of Marine Biological Communities: Field Biology and Environment, G.J. Bakus. Wiley-Interscience, John Wiley & Sons Inc., Hoboken, NJ (2007). 450 pp. (plus CD-ROM), Price: US\$ 99.95, ISBN: 0-470-04440-3**

In this text, Bakus combines common quantitative techniques with recent advances in quantitative methodology and demonstrates how this combination can be used to study marine organisms. Among the topics covered are plot/plotless sampling, biometrics, experimental design, game theory, optimization, time trends, modeling, and environmental impact assessments.

The author's goal in writing this book was "...an attempt to combine ordinary quantitative techniques with relatively new advances in quantitative methodology." His emphasis was on application of the foregoing to shoreline and seashore habitats especially intertidal (littoral) and scuba depth regions.

The book has the following eight chapters:

1. Biological sampling design and related topics;
2. Types of data, standardizations and transformations, introduction to biometrics, experimental design;
3. Quantitative methods in field ecology and other useful techniques and information;
4. Community analyses: similarity–dissimilarity indices, cluster analysis, dendrograms, analysis of similarities, indicator species;
5. Community analysis: ordination and other multivariate techniques;
6. Time trend analysis;
7. Modeling and systems analysis;
8. Marine sampling and measuring devices.

The foregoing chapter titles will give the reader a good overview of the major review and use of statistics in the text. Numerous mathematical examples are given but no student problems are.

A CD-ROM accompanies the book. It contains a condensed and animated version of several basic statistical programs plus hints on running them. The disc also contains additional information amplifying topics covered in the text. Another "modern" technique utilized was a discussion of PowerPoint presentations with instructions for their creation.

Literature citations are even given to such references that tell "how to lie with statistics." Completing the modernization of information transfer was the inclusion of numerous web site locations that could be consulted for more information.

Given my lack of familiarity with the topic, I was fascinated by the numerous pictures of marine water sampling devices shown in Chapter 8. Less interesting, yet impressive, was the list of more than 600 references.

I am certain that this book will be well received by both students in marine biology and practicing marine biologists.

Gary F. Bennett\*

*The University of Toledo,*

*Department of Chemical and Environmental Engineering,  
Mail Stop 305, Toledo, OH 43606-3390, United States*

\*Tel.: +1 419 531 1322; fax: +1 419 530 8086.

*E-mail address: gbenett@eng.utoledo.edu*

19 February 2007

Available online 3 March 2007

**High-Performance Gradient Elution: The Practical Application of the Linear-Solvent-Strength Model, L.R. Snyder, J.W. Dolan. John Wiley & Sons, Inc., Hoboken, NJ (2007). 489 pp., US\$ 89.95, ISBN: 0-471-70646-9**

High-performance liquid chromatography is widely used for separation and analysis. However, many samples cannot be successfully separated by the use of fixed conditions, requiring instead, gradient elution also called solvent programming which causes a change in the mobile phase composition during the separation so as to progressively reduce sample retention.

Prior reviews of this technique need updating and simplifying. Hence this book whose goals are to present: (1) a practical summary of what the reader needs to know in order to carry out gradient separations, (2) a conceptual understanding of how gradient elution works, and (3) a detailed examination of the underlying theoretical framework of gradient elution for application to special situations and to satisfy any lingering doubt of the reader.

The authors' ultimate goal is to show readers that gradient elution can be easier to understand and use than they think. The back jacket of the book notes its features as a "Comprehensive treatment of gradient elution that:

- provides specific, step-by-step recommendations for developing a gradient separation for any sample;
- describes the best approach for troubleshooting problems with gradient methods;
- guides the reader on the equipment used for gradient elution;
- lists which conditions should be varied first during method development, and explains how to interpret scouting gradients;
- explains how to avoid problems in transferring gradient methods."

The beginning of the book describes the application of isocratic and gradient elution for typical samples. In Chapter 2, the authors provide a conceptual basis for better interpretation and use of gradient elution. Following this chapter, is one on method development. "In Chapter 4, the equipment required for gradient elution is discussed. Chapter 5 deals with experimental problems that can be encountered in gradient elution as well as related troubleshooting information. Chapter 6 recognizes important differences in gradient elution when this technique is used for macromolecular samples... Chapter 7 expands the discussion of earlier chapters to the use of gradient elution for preparative separations... Chapter 8 examines (a) separations which feature the combination of gradient elution with mass spectrometric detection, (b) the application of gradient elution to normal-phase and ion-exchange separations, and (c) the use of complex gradients formed from three or more solvents. Chapter 9 concludes with a more detailed treatment of the fundamental equations of gradient elution, including attention to so-called 'non ideal' contributions to gradient separation."