Managing Science: Management For R&D Laboratories
Claude Gelès, Gilles Lindecker, Mel Month and Christian Roche, John Wiley & Sons Inc., 1999, 359 pp, £51.95, hardback, ISBN 0-471-18508-6

Creativity is not important for high energy physics research. At least, that's the conclusion I draw from this book, which has not a single mention of the subject. For a text that purports to present "a complete set of tools for the management of research and development laboratories and projects", I find that surprising.

Clearly in a relatively slim volume, the authors cannot include everything, but the book has a peculiar imbalance. It is not the generally applicable R&D management text book I had expected from the publisher's pre-publication literature. The authors, all the examples and most of the data, come from a high energy physics background. The case studies are all US-based, despite the authors' extensive European experience. Are 'Big Science' laboratories really so isolated from their environment?

The 12 chapters of Part I cover topics such as; the reasons for building the laboratory, its organisation, policy, project management, human resources management, finance and cost, services, and outside suppliers.

Matrix and line structures are introduced very briefly and illustrated by 11 pages of organisation charts. Unfortunately there is little real discussion of the pros and cons of each type, beyond observing that matrix structures are "especially susceptible to miscommunications and behavioural anomalies". A whole chapter describes the problems of handling mail, but without any reference to the key problem of who is authorised to say/send what to whom (R&D results are often confidential).

I was a bit surprised to see that the first item listed under 'Development Plan' in the 'Plans Cascade' was 'Divestment'! No wonder they had so much 'deviancy' (see later).

There is nothing in the text on research project selection and only the briefest of discussions on portfolio design, presumably because of the limited number of relatively large projects handled by high energy physics laboratories. In 'industrial' laboratories with a multitude of projects and perhaps 'sponsors', these are seriously time-consuming activities.

A number of pages are, of course, devoted to quality assurance, though the authors observe that ISO 9000 does not guarantee that products or services are of the quality demanded by the customers.

The six chapters of Part II deal with the people in the organisation and the effort needed to build coherent operating units.

The authors quite correctly identify that human behaviour can become a dominant factor in an organisation. They then go on to introduce the concept of 'organisation deviancy', which results from a 'build-up of workplace behaviour'. I suspect, however, that this is a characteristic of the sort of laboratories experienced by the authors. Judging by the eight pages of charts that illustrate this topic, once such laboratories are set up, they go through life with a steadily ageing population. The oil/chemical company laboratories, which I have been in or around during the last 25 years, have had constantly refreshed populations, as we regarded staff transfers as an essential component of technology transfer.

Possibly as a consequence of the static population the authors seemingly come from, staff selection is only briefly dealt with, concluding that interview by a selection board is "an efficient way to judge a candidate". No mention is made of more modern techniques such as assessment centres.

I also found it surprising that, in these days of constant flux, there is only a single page devoted to the management of change and no reference to further reading.

The book is very variable in its level of detail. For example, we learn that it is a good thing to have students on site. Their rooms must have a "small bath" and should be cleaned "at least twice a day". On the other hand, negotiation, "a fundamental and universal activity of management", is dealt with in four lines! Some of the writing is rather obscure and it is not all easy reading. There are several typing errors and the first three equations in the book also have errors in them. I suspect that at least some of these problems arise from the book's having several authors.

However, it is not all bad and, like the curate's egg, parts of it are excellent. In that respect I found Part II — 'The Human Drama' rather more thought provoking than Part I — 'The Management Structures'.

The book contains a number of gems which I recognise from my own experience. For example, "When a space problem arises, top management needs a strong personality to find a solution for a seemingly trivial problem." The space referred to is, of course, of the office rather than of the universe variety! The authors discuss the problems of performance measurement in an R&D environment. Apparently a Nobel prize is a useful indication. RAE assessors please note!

While we are on the subject, some amazingly candid tips on appraising organisations are given towards the end of the book. They include; "Are you meant to give an honest assessment?", "Will you cast a blind eye in particular areas?", and "Is the outcome predetermined?"

There is an impressive list of "selected references" at the end of the book but, unfortunately, there are no links to the main text. Such links might have gone some way towards correcting the omissions I have mentioned above.

This is not a comprehensive DIY guide to research management for the beginner, but it does illustrate some of the pitfalls to be avoided. It includes a number of case studies and exercises which will be useful for stimulating discussion. However, Bamfield's book [1] might be a better starting point on this topic for chemical engineers.

References

[1] Peter Bamfield, Research and Development Management in the Chemical Industry, VCH, Weinheim, 1996.

Anthony D. Barber
Redwood, 92 Charles Close, Wroxham
Norwich NR 12 8TT, UK
E-mail address: adbarber@netcomuk.co.uk (A.D. Barber)
PII: S1385-8947(00)00124-8

The physics of foam

Denis Weaire and Stefan Hutzler (Eds.): Oxford University Press, 1999, 246 pp, £47.50 (hardback), ISBN: 0-19-850551-5

What is it about physicists? The former Shell Group Research Co-ordinator, Dr. Harry Beckers (a physicist) once referred to chemical engineers as dung beetles, while he likened physicists to dragonflies. I got something of that same feeling when I started reading this book.

The title is accurate in that the authors have indeed restricted themselves to the physics of the problem and barely touch on the chemistry or engineering which, according to them, deal with different length scales (an interesting concept). They also admit to a "very prejudiced synopsis", ignoring the 'voluminous literature of the chemical and chemical engineering communities, often working in industrial laboratories'. Weaire and Hutzler dismiss such work as 'frankly empirical'. While conceding that the results may be of immediate practical value, they conclude that these results "generally offered little additional insight to that of the blind Belgian of the 1870s". I should probably declare an interest at this point, but I think that is a rather harsh judgement.

Despite the above irritation, this is a very readable book and a must for anyone interested in either the applications or the problems of foam.

The book starts with a brief review of early work by Plateau (the blind Belgian), Lord Kelvin and others, including a comprehensive bibliography based on that of another early worker, Mysels. It then moves on to a detailed discussion of foam structures and how they may be made. This is followed by a review of various imaging and tomographic methods, though no mention is made of radioactive tracer or transmission techniques. Later chapters discuss modelling, rheology, and electrical conduction through foams.

There is a substantial chapter on foam drainage through the Plateau borders in which the authors present their recent theory. In the development of this theory, Poiseuille flow (immobile surfaces) is assumed. While this is a reasonable assumption (certainly from an engineering point of view!), it is not at all clear that this is, in fact, the case in practice and is a serious limitation of the otherwise elegant theory presented here. A 'proper' treatment would require the inclusion of (surface) chemistry effects, which would be outside the scope of the book. Consideration of such effects will, however, be essential for a complete solution to the problem and will require a multidisciplinary approach.

Film thinning and the consequent foam collapse are treated more superficially than structure and drainage presumably because a detailed description of these areas also cannot adequately be made without due consideration of the surface chemistry. There is, however, sufficient discussion to point the reader in the right direction.

Unfortunately, the chapter on applications of liquid foams restricts itself to a review of aqueous systems whereas many foams of commercial significance occur in non-aqueous systems. Solid foams, such as polymers and metals, and some 'natural' foams, such as stormy seas and cuckoo spit, are also briefly discussed and certainly serve to further enhance the attraction of the book.

Most chapters have a short, but useful, bibliography and there are adequate references to the photographs, etc. included in the captions. There are nine appendices with more details of some of the more complicated theories. The book is also peppered with quotations, including Einstein's particularly apt (in this case) observation that "Things should be made as simple as possible but not any simpler". Some beautiful (albeit monochrome) photographs of bubbles and foams, both technical and artistic, further complement the text. There are also plenty of appropriate diagrams, graphs and sketches.

Despite its limited coverage, essentially a comprehensive discussion of foam structures and drainage through the borders, this book should be compulsory reading for anyone starting (or already engaged in!) research in this field. I do not believe that industrial practitioners will find anything of direct use, but even such readers are likely to find items of interest. The authors are well aware of the book's limitations and one of the final illustrations is a map of the field showing the many areas still awaiting thorough treatment. Hopefully, this will inspire interested workers of all disciplines to tackle this industrially important problem.

A.D. Barber
Redwood, 92 Charles Close, Wroxham
Norwich NR12 8TT, UK
E-mail address: adbarber@netcomuk.co.uk (A.D. Barber)
PII: S1385-8947(00)00127-3