BOOK REVIEWS

Calculated risks, 1st edition. BY JOSEPH RODRICKS (Pp 256; price £17·95 H/b, £9·95 P/b). 1992. Cambridge: Cambridge University Press. ISBN (H/b): 0521-41191-2; ISBN (P/b): 0521-42331-7.

This readable and fascinating book provides an up to date introduction to toxicology and the safety evaluation of chemicals. Of even greater interest to lay readers and doctors alike, it lifts the scientific façade to reveal the inadequacies of quantitative risk assessment as practised in the United States by certain regulatory agencies for some years.

Rodricks devotes nine clearly written chapters to a systematic explanation of toxicological end points and test principles. He covers acute, chronic, reproductive, and genetic toxicity, carcinogenicity, and dose-response. He then distinguishes carefully between toxicological hazard (the potentially harmful properties of a chemical) and risk (the probability that the relevant toxicological effect will actually occur) before turning to risk estimation.

Much of the balanced and sensible discussion that follows focuses on carcinogenicity—and with good reason. This is the area in which much unnecessary public anxiety has been produced by such media declarations (to quote one of his examples) as: "One person in every ten thousand will contract cancer from residues of EDB in flour. . ." As the author explains, what the regulators themselves actually say when they announce the figure produced by a mathematical quantitative risk assessment model is always highly protected by elaborate bet-hedging, ifs and buts. But it matters little how the figure is hemmed around by conditions and qualifications, once the media seize on it.

The truth of the matter, as Rodricks points out, is that for most of the putative carcinogens (whether man made or natural) in food and the wider environment, there is usually little or no epidemiological information and, in the absence of human data, all that is left are the results of any animal studies that may have been conducted. There are enormous difficulties involved in estimating human carcinogenic risks quantitatively from rodent studies. There is, for example, the question of interspecies difference: but an even greater problem is the interpolation from very high doses in rodents (needed to achieve effects in studies containing only a few hundred animals), to the region of the dose-response curve relevant to the minute quantities that reach humans. In this very low-dose region, the shape of the curve (including the existence of any threshold) is always unknown.

Major assumptions therefore accompany the use of unvalidated quantitative risk assessment models, and it is hardly surprising that the different models yield widely differing results. In view of the many unknowns, regulators often play safe and use worst case assumptions; for example that the curve is linear in the low dose region and possesses no threshold. Worse still, the models take no account of toxicokinetic and mutagenicity data. Taken together, the omissions and worst case assumptions lead cumulatively to the upper bound risk figures, which breed public chemophobia, opportunistic politics, and unrealistic regulatory burdens, when the all important explanatory wording is overlooked.

The author provides a telling discussion of the legislative anomalies and inconsistencies that have arisen in the United States when these methods have been used to underpin the regulatory control of different categories of chemical products and contaminants. Finally, he offers his own suggestions for future improvements, and these are very much in line with the thinking of regulatory toxicologists in the United Kingdom.

G E DIGGLE

Lung Function. Assessment and Application in Medicine, 5th edition. By JE COTES. With the editorial collaboration of GL LEATHART (Pp 768). 1993. Oxford: Blackwell Scientific Publications. ISBN: 0-632-03526-9.

Lung Function by John Cotes is an institution, as much a part of a lung function laboratory as a Douglas bag. After a gap of 12 years a fifth edition has been published. As before the book provides a practical guide for testing lung function with the relevant physiological background, and a strong emphasis on standardisation and reference values. The format is broadly as before but the book has been extensively revised. This edition has some surprises—a fascinating introduction on how atmospheric oxygen concentrations have changed over the last few billions of years and the possible changes in the future if the Gaia hypothesis of James Lovelock is correct. It also, believe it or not, contains cartoons—but not many. The layout has been changed and is generally improved although the printing was faint in parts of our copy—for example page 110 where the superscripts on one equation are not legible.

The book maintains many of the features, good and less good, that have characterised Lung Function in the past. Its strengths are its care over methodological detail for the practising lung function technician and research worker, the wide range of reference values and its breadth. The chapter on normal values has always been particularly useful and this has now been extended to cover reference values from the European Coal and Steel Community in addition to those for several other groups including adults of African and Indian descent, United States adults, men from Pakistan working in the United Kingdom, new born babies, young infants, and normal values in children and young adults. There are some useful new tables—for example, 8·2—although some are less helpful—for example, 6·1. The book is strongest when the various tests that are available are discussed, how they should be carried out, and their interpretation. The emphasis on detail and standardisation allows laboratories to set up new techniques and be reasonably confident that they can produce reliable data. Lung function testing is approached from the viewpoint of a physiologist and may sometimes seem a little impractical to a busy clinician or fieldworker. It may be ideal, as Cotes suggests, to obtain a flow volume loop every time you measure FEV_1 but this is not possible in busy clinical practice and in many epidemiological circumstances. Details of management—for example, table 16·13—are inadequate and would be better omitted.

In chapter 3 Cotes tackles the difficult problem of numerical treatment of results with illustrative examples. Some of these are difficult to follow or rather small print—explaining when coefficient of variation is and is not appropriate would have been helped by a figure. More discussion on the assessment of repeatability would have been welcome.

The physiological background is approached rather mathematically and assumes some knowledge of lung physiology. What would be regarded as basic and important respiratory physiology, for a registrar in training, for example, is mixed with sometimes less than clear discussions of rather esoteric areas of lung physiology. Discussion of the equal pressure point and flow limitation is a case in point, not helped by figure 5·15. Some old tests—for example, the Riley bubble method for assessing blood gas tensions—are retained whereas some of the newer techniques such as challenge tests are given insufficient space. The index was always the most frustrating aspect of this book, the chance of obtaining a page number on first attempt being fairly small. Look up "anatomical dead space" and you read "see dead space, anatomical".

These reservations are minor and there is no doubt that *Lung Function* with this new edition will continue to be the best laboratory reference book for lung function measurements as it has been for many years. We congratulate John Cotes on maintaining such a high standard and for the help that this has given to lung function technicians, research fellows, and respiratory physicians over the years.

AE TATTERSFIELD
BG COOPER

CORRECTION

Asbestos, cement, and cancer in the right part of the colon (1994;51:95–101). During the technical editing stage, two numbers were inadvertently changed in the right hand part of table 1. The correct version is given here.

Rectum			
ICD 154			
O	*E*	*SIR*	*(95% CI)*
13	7·87	1·65	(0·88–2·83)
11	7·17	1·53	(0·77–2·75)
24	15·0	1·60	(1·03–2·41)
1	0·91		
11	7·32		
13	7·05		
2	1·17		
1	0·57		
3	2·72		
1	1·32		
32	21·1	1·52	(1·05–2·17)
44	45·6	0·97	(0·70–1·31)