



## Book reviews

*Review of 'Air Pollution and Health'*. Editors R.E. Hester and R.M. Harrison, Royal Society of Chemistry, 1998, £22.50.

This book offers a significant contribution to the scientific debate concerning the potential effects of air pollution on human health. The scope of the book includes an outline of the regulatory philosophy and processes underlying human health risk assessment and the setting of environmental air quality standards. There is also a unique account of current biological research into airborne particulates ( $PM_{10}$ ), and an overview of the nature and effects of indoor air pollution.

The book begins with a chapter by Jon Ayres, on oxidant gases. There is an enormous toxicological database on each of the gases reviewed, but fortunately, the author has produced a very focused and critical account of the key data relevant to environmental health considerations. The author concludes that sulphur dioxide and ozone are the most important oxidant gases with respect to acute health effects in the general public. However, there is a suggestion that ozone should be regarded as a non-threshold substance, a concept which is debated elsewhere in this book.

This is followed by a chapter on the mechanisms of lung injury caused by  $PM_{10}$ . This has been written by Ken Donaldson and Bill McNee—both leaders in the field of particulate toxicology. The scope of the chapter is wider than the title suggests, as its most important aspect is the elaboration of a hypothesis for the ability of  $PM_{10}$  to exacerbate cardiovascular disease. The significance of this hypothesis lies in the fact that as yet, there is no agreed biological basis to explain the apparent association between  $PM_{10}$  and cardiovascular effects. From the information presented throughout this book, it is clear that environmental  $PM_{10}$  is a major health concern, and the views presented in this chapter are likely to generate considerable interest. However, it remains to be seen whether the proposed hypothesis will prove to be correct.

The next chapter, by John C. Larsen and Poul B. Larsen, focuses on a different area of concern, i.e. the risks of cancer from exposure to chemical carcinogens. Quantitative risk estimates for a number of genotoxic carcinogens are calculated based on two key assumptions: there is no threshold dose which would not incur some degree of risk; and risks from low-level environmental exposures can be calculated by linear extrapolation of results from studies in workers or in animals, where exposures are substantially higher. The validity of these assumptions is open to question, and there are other associated areas of uncertainty such as the relevance to human health of tumour findings

in animals where species differences in metabolism could be significant. Interestingly, in the case of formaldehyde, two different approaches to risk assessment are presented: one is based on linear extrapolation of nasal cancer data in rats, and the other is based on the view that exposure to levels below the threshold for nasal sensory irritation would incur a negligible cancer risk. Overall, this chapter should stimulate interest and debate among those concerned with the effects of air pollution and those involved in cancer risk assessment in a wider context.

The fourth chapter, written by Roy Harrison, is concerned with setting health-based air quality standards. It provides a very clear exposition of the regulatory processes involved and what the standards are meant to convey in terms of health protection. A number of controversial areas are thoughtfully discussed, such as the existence of thresholds for genotoxic carcinogens, particulates and ozone. This chapter touches upon diverse issues such as risk perception and the cost-benefit considerations of standard setting. Overall, a highly stimulating and informative chapter.

The penultimate chapter, written by Morton Lippman, furnishes an authoritative account of the basis for the US EPA standards for particulate matter and ozone. There is a detailed explanation of the composition and sources of airborne particulates, and a balanced and intelligent analysis of the relevant epidemiological evidence, with due acknowledgement of the areas of uncertainty. This is compulsory reading for those with an interest in the health effects of air pollution.

The topic of the final chapter, written by Paul Harrison, is that of indoor air pollution. It provides a salient reminder of the fact that the majority of the general population spend most of their time indoors, and overall, indoor exposures dominate in almost every sense over those from external air. This chapter draws attention to the importance of considering the potential confounding influences of indoor air exposures when interpreting epidemiological evidence on the effects of outdoor air pollution. The information in this chapter is likely to serve as a real eye-opener to many readers, and it helps to put whole topic of outdoor air pollution in perspective.

This book is highly recommended to all those health professionals who wish to keep in touch with current knowledge and thinking on the subject of air pollution and health. Furthermore, in view of the commonality of the issues, this book will be highly relevant to all those involved in occupational health risk assessment.

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PII: S0304-3894(99)00012-6

*Risk Assessment: Logic and Measurement*, M.C. Newman, C.L. Strojan (Eds.), Ann Arbor Press, Chelsea, MI, 1998, \$65.00, 352 pp., ISBN: 1-57504-048-4

The origin of the information in this book was a seminar (whose title was the same as the book's title) held at the Savannah River Ecology laboratory in 1996. Printed are 14 major chapters (there are two others comprising a short introduction and conclusion)