accumulation. It is indeed the very properties which make PCBs so useful to the electrical industry that lead to persistence and accumulation.

This booklet, published under the joint sponsorship of the United Nations Environment Programme and the World Health Organization, provides a useful review of the environmental and toxicological properties of polychlorinated biphenyls and terphenyls and analytical methods. It is factual, sensible, and balanced. The only possible criticism is that perhaps it fails to differentiate adequately between the higher chlorinated compounds and the lower, in so far as there exist substantial differences, both in toxicity and in biodegradability.

ALEXANDER MUNN

Hygiene Standard for Impulse Noise. No. 5 of a Series produced by the British Occupational Hygiene Society Committee on Hygiene Standards. Published in *Annals of Occupational Hygiene*, (1976), 19, 179-191. Price £2 from Mr P. J. Hewitt, Honorary Business Secretary, BOHS, University of Bradford.

This document reviews the evidence which has become available since the drafting of the earlier British Occupational Hygiene Society *Hygiene Standard for Wide Band Noise* (published 1971) and the Department of Employment *Code of Practice for Reducing the Exposure of Employed Persons to Noise* (published 1972). The conclusion reached is that the equal energy concept (i.e. a 3 dB(A) correction for every halving or doubling of exposure time) is applicable, and the above documents may be extended to include impulse noises which show a peak level of up to 150 dB(A) followed by a near-exponential decay envelope. This includes virtually all impulse noise of industrial origin but not, for example, explosive noises such as those from firearms or weapons fired outdoors. In this connection, it is perhaps unfortunate that the title had not been made more specific by the inclusion of the word 'industrial'.

A useful Appendix includes methods of measurement and calculation of equivalent continuous sound level (L_{eq}) for impulse noise. It stresses that conventional sound level meters, graphic level recorders and statistical distribution analysers (of the electromechanical type) are not suitable

for measuring discrete impulses spread in time. It must be hoped that this will further discourage a practice, which seems fairly widespread, of deriving so-called average levels by applying arbitrary duration factors to 'slow' sound level meter readings, as the result is inevitably an underestimate of the real situation. Some elaboration of techniques and practical use of suitable instrumentation in the form of a following paper or review would have been useful, and the early publication of such guidelines would still be welcome if the Subcommittee on impulse noise could be reconvened.

This is an important publication covering an area of industrial noise which previously has not been adequately considered by standardising authorities and the like. However, it is essential that with the present state of knowledge, extrapolations are not made to situations beyond the limits specified.

W. I. ACTON

Protection of Workers against Noise and Vibration in the Working Environment. (Pp. 74; 17.50 Sw. fr.) ILO: Geneva. 1977.

'This code of practice was adopted at a meeting of experts convened by the ILO', runs the summary on the back cover. These beginnings have resulted in a rather theoretical document with the liberal use of adjectives such as 'suitable', 'adequate', 'qualified', 'competent' and so on, but generally without practical guidance as to what is suitable or adequate, or who is qualified or competent.

The basic exposure criteria adopted are generally in line with current scientific thinking. A 'warning limit' of 85 dB(A) and a 'danger limit' of 90 dB(A) are set for noise with the use of equivalent continuous sound levels derived according to the equal energy concept for shorter periods. Unfortunately, the only tabulated figures are derived according to the American 5 dB(A) rule, and although they are intended to be specific to tractors, their inclusion can only lead to confusion on the part of readers not versed in the fundamentals of acoustics and the history of the situation. Utilisation of the draft International Standard for whole body vibration exposure is recommended.

A number of statements are made which appear to be without scientific foundation,

and for which substantiating references are not given. For example, loss of weight and anaemia are listed as results of exposure to noise, women are said to be especially susceptible to vibration, and youth (under 18 years) and age (over 50 years) are considered to be medical contraindications for vibration exposure.

For practical guidance, it would seem better to follow Codes of Practice such as those published by the British Health and Safety Executive and similar authorities. Nevertheless, this is a book which ought to be read by industrial medical, safety and personnel officers, both as a useful check list for their own plan of action and also as an aid to appreciating the arguments and perhaps legislation they may have to face in the foreseeable future.

W. I. ACTON

Law on Accidents to Health Service Staff and Volunteers. By W. A. J. Farndale and Susan Russell. (Pp. 72; £5.50 soft cover, £7.50 hard cover.) Ravenswood Publications: Beckenham. 1977.

This book, which is No. 7 in the series *Studies in Health Service Management Law and Practice*, seeks to provide a guide to the legal implications of accidents at work, especially to health service staff and volunteers. It is intended for all employers and employees, particularly those in the health service, as well as students, trade unionists, lawyers and lecturers. It is, perhaps, scarcely surprising that in only 60 pages of text the book does not fully achieve such an ambitious aim.

The method which the book adopts of prefacing each chapter with a question and following it with explanatory text, leads in this instance to a degree of repetition which is not entirely justified by the claim in the introduction that repetition is valuable in teaching. Probably the majority of those reading the book will be using it for reference rather than for learning. Moreover, some of the matters which are repeated are of no great importance, such as the statement that neither National Health Service hospitals nor the Department of Health and Social Security take out an employers' liability insurance. This in no way affects the right of an injured employee to compensation. The purpose of employers' liability insurance is simply to ensure that the employer can pay the compensation.

Book reviews

Although it is claimed that a previous knowledge of the subject is not assumed, there are parts of the book which are intelligible only to someone with prior legal knowledge. Some legal concepts, such as *volenti non fit injuria* (voluntary assumption of risk), are introduced but explained only many pages later. Some cases, on their first appearance, are referred to as if they are old favourites well known to the reader (like the reference to *Bourhill v. Young* as 'the pregnant fishwife's case' with no further description). Comments are made about other cases which can be understood only by those who are already familiar with their facts.

Contrasted with this, and despite the pressure on space, about four pages in all are spent in explaining a single case, *Robinson v. Post Office*, while the points it covers could have been dealt with much more concisely. At the same time other topics, such as the availability of an action for breach of statutory duty and the contribution rules for social security benefits, are largely or completely neglected.

The book is also marred by an unusual number of careless errors. There are about a dozen in the table of cases. Among the errors in the text a Social Security officer is referred to as a Social Services officer, a Law Lord is stripped of his title and demoted to the Court of Appeal (with his name spelt wrongly, to boot,) and the Pearson Commission is said to be considering what compensation should be payable for *anti-natal* injuries.

It is to be regretted that although potentially useful this book cannot be recommended.

ROBERT A. PEARCE

Some Aspects of Pneumoconiosis in a Group of Mechanised Iron Foundries. Joint Standing Committee on Health, Safety and Welfare in Foundries: Third Report of the Subcommittee on Dust and Fumes. (Pp. 72; £2.50) HMSO: London. 1977.

Any study of the progression of pneumoconiosis, and consequent dysfunction is complicated by problems of subject selection, retirement, change of jobs to and from other dusty industries and the concurrence of other pulmonary disorders. This pamphlet, which attempts to relate progression of pneumoconiosis in

foundry workers to conditions at work, makes a bold attempt to overcome these difficulties by limiting its objectives to a simple measurement of progression on two films ten years apart in subjects already selected because they had pneumoconiosis, and relating this to a subject's occupation in the foundry. As far as it goes, it is possible to conclude that foundryman's pneumoconiosis may progress, even after the man has ceased work, and that progression is more likely in the more dusty jobs. Moreover it states that progression is prevented if the worker wears an approved respirator and that the condition should be eliminated by proper dust control.

However, the limitations of this survey are considerable and the layout of the report is clear evidence that it was written by a committee rather than by an author. The format is such that 52 of the 72 pages are appendices and it would appear that not always have the same number of subjects been analysed by the various authors. The details of radiographic method (100 mm films were used) are not given until Appendix 6, where the comments of the clinicians are speculative and imprecise. The physiological findings are valueless and the actual estimates of dustiness are based on engineering inspection some six years after the survey finished.

This pamphlet is hard to read and its conclusions are of limited value. It is however a first attempt to measure progression of pneumoconiosis in the foundry industry. It is therefore recommended reading for those who plan further studies, providing as it does a useful survey of the difficulties and an object lesson in how not to present the results.

ANTHONY SEATON

Proceedings of the Meeting of the Scientific Committee on Occupational and Environmental Health of the Carlo Erba Foundation, Milan, 12 December, 1975. (Pp. 147; Free of charge.) Carlo Erba Foundation, Occupational and Environmental Health Section, Via Cino del Duca, 8, 20122 Milano, Italy. 1976.

In his paper 'Experimental and Clinical Investigations for Assessing the Toxicological Hazards of Industrial Chemicals' Professor Robert Lauwerys (Brussels) stresses the need to adopt a flexible, intelligent and experienced approach. He

outlines guidelines which he uses to assess the data available for dimethyl formamide (DMF). This exercise leads him to recommend further long-term inhalation studies in animals and epidemiological surveys of workers exposed to DMF with emphasis upon liver function and porphyrin metabolism.

In the subsequent discussion section we are reminded that the same basic principles apply to all toxicological investigations, whether they be of industrial chemicals, drugs or pesticides. Pleas are made for toxicological data to be made more generally available, for greater attention to the assessment of central nervous toxicity and to long-term effects of low exposure, and for precise documentation of studies to permit future re-evaluation should the need arise. Toxicologists are asked to advise legislators clearly about the merits and limits of current toxicological tests. Readers are asked to consider the logistical problems, how many industrial chemicals should be tested and to what depth.

Professor Irving J. Selikoff (New York) in his wide-ranging paper, 'Perspectives in the Investigation of Health Hazards in the Chemical Industry' examines criteria for setting priorities; experimental and epidemiological methods and the roles of industry, labour and government. Studies of large groups of occupationally-exposed workers, particularly those exposed to widely disseminated materials should, he considers, receive high priority, as should studies of chemicals already suspect. In the discussion section attention is drawn to the difficulty in discovering how much of an individual chemical (finished or intermediate) is in use; to the need for involvement of an educated public in the evaluation of an acceptable risk, to the value of negative data, to the difficulty experienced in obtaining funds for such work and to the need to define clearly the sensitivity of the methods used when reporting a negative effect.

In the section on mutagenicity tests for the detection of carcinogenic activity the review paper by Dr Bartsch (Lyon) on the Salmonella test system is an excellent short resumé of the field.

The relationship between carcinogenesis and mutagenesis is explained and the advantages and limitations of *in vitro* test systems described. The point is made that, in preliminary screening tests, false negatives and false positives are probably unavoidable, but for a final test no false positives can be tolerated. Needless to say,