date. Approximately 500 or more names of industrial chemicals, drugs, insecticides and other compounds are arranged alphabetically. Under each name all the essential data are listed under clear sub-headings: synonyms, route of entry into the body, toxicity, treatment and recommended precautions.

Doctors and others in the field of occupational medicine and hygiene and those concerned with the treatment of possible intoxications, will find this a very useful reference book.

I find it difficult to understand the rationale behind the inclusion of ingestion as a route of entry for some compounds (liquids and even powders and flaky solids) and omitting this route for others. Systemic absorption from the stomach did not seem to be the sole reason. Nor is mention made of the hazard from aspiration of petroleum hydrocarbons (especially those of low viscosity) following ingestion, a hazard most occupational physicians agree is greater than any systemic effect following absorption from the stomach.

The treatment that is recommended following ingestion is gastric lavage. Many authorities would disagree that this is the only method of treatment for ingestion as the author implies. No mention is made of induction of emesis with ipecacuanha (especially in children), the length of time following ingestion, or even that aspiration of the stomach contents must be avoided.

These criticisms apart, the book serves, its purpose very well as a quick reference guide for all those concerned with occupational medicine who may be called on to give advice on the adverse effects of many industrial compounds.

R. C. LEMON

Industrial Audiometry. By M. E. Bryan and W. Tempest. (Pp. 56; illustrated; £2.25) Published by the authors. 1976.

The Foreword opens with the tale of Joe Wilson who went deaf because of the negligence of his employer, and who successfully claimed damages in Common Law. This story might have been better told in a Trade Union paper. Much later on, the objectives of the booklet are stated as 'a practical guide for . . . anyone who may be involved in the conservation of hearing, or with the assessment of hearing damage due to noise. It is hoped it will also serve as a guide to those who have to make decisions . . .'. The former aspect has been covered quite well, but

far less assistance is forthcoming for those who have to make decisions.

Topics such as the choice of hardware, calibration and maintenance of equipment, and the effects of background noise and other factors on accuracy have been dealt with thoroughly, but these facts are readily available from standard texts. Audiometric threshold data have been quoted relative to International Standard throughout, without mention of British Standard data for earphone types in common use in this country. The specimen pre-audiometric medical questionnaire is exhaustive, but some explanation of how the factors listed can affect the hearing might have engendered more enthusiasm in those who have the tedious job of asking the actual questions. Taking audiometric thresholds by the method of limits has been described in some detail, which should help to overcome some of the slipshod practices encountered all too often in industry. The instruction to take care 'to ensure there is no collapse of the ear canal' has been given, but how is this to be effected when the ear canal is not visible? The detection of nonorganic hearing loss, including malingering, has been mentioned, but more detail would have been welcome as this problem will almost certainly become more widespread with the increasing scale of industrial injuries benefits and Common Law litigation.

Only median data have been given for the effects of presbycusis (hearing loss due to advancing age), whereas statistical spreads would have been more useful in deciding whether a given audiogram was within the normal range for a particular age. The difference between typical audiometric patterns produced by exposure to continuous or steady-state noise on the one hand and exposure to impact or impulse noise on the other has not been mentioned in the text, yet is apparent from certain figures. How should the already deafened person who requires to hear warning signals for the maintenance of safety be managed? With ear protection, the signals will not be audible, yet without protection the hearing loss will worsen. Discussion of this important question has been omitted.

Considering the relatively high price, the booklet is poorly presented and produced, and the standard of printing left much to be desired in the review copy. Several trade photographs have been used which have not reproduced well. Finally, the authors tend to confuse their role as members of the academic staff of a Uni-

versity with their private consulting interests.

W. I. ACTON

Underwater Medicine. By S. Miles and D. E. Mackay. Fourth edition. (Pp. 330; illustrated; £10.00) Adlard Coles Ltd: St. Albans. 1976.

Four editions and one reprinting in 14 years is perhaps the best objective measure of the success of this book. In the current edition Admiral Miles has been joined by Captain Mackay, formerly Senior Medical Officer, Underwater Medicine Department, Institute of Naval Medicine, Alverstoke, Hants.

In the last decade there has been an unprecedented increase not only in the number of men involved in professional diving but also in both its depth and duration. This has been accompanied by a great expansion in the associated research fields with an accompanying outpouring of scientific papers particularly in the United States. One result of all this activity has been an awareness among a large number of doctors who have been drawn into the fringes of the subject that they should acquire some basic knowledge of underwater medicine if only to satisfy their own curiosity.

As explained in the preface to this Fourth Edition, the book is not a reference textbook but rather a selection of aspects of the subject that seem to be firm and of use for future foundations.

It would be wrong to give the impression that the book is only about diving; it is about the underwater environment, understanding it, the hazards associated with it and how to come to terms with it. Chapters on drowning, water safety, submarines and marine animals are included. On looking back at the first edition it is interesting to note that there was no mention of saturation diving or submersibles and habitats. Instead of the in-phrase 'life support equipment' the corresponding chapter was just called 'underwater equipment'.

It was my intention when I began to read this book to note points which I could criticise and discuss in detail when I finally came to write my review. At the end I had so few notes which in retrospect looked so trivial that I have decided to give this book what can only be its due: that is, sound praise as a splendid and interesting overview of underwater medicine. Its contents should be known to every general practitioner and it should be learnt and digested by every doctor who

intends to take more than a passing interest in the subject.

* Knowing of my own involvement with this subject many medical students and doctors ask me what they can read as background material: Miles and Mackay is my answer.

D. N. WALDER

Early Detection of Health Impairment in Occupational Exposure to Health Hazards: Report of a WHO Study Group. Technical Report Series 571. (Pp. 80; 8 Sw. fr.) WHO: Geneva. 1975.

In this Report a WHO Study Group points out that in order to prevent overt disease or disablement the criteria of health impairment should, if possible, be based on early reversible changes preceding the occurrence of manifest signs and symptoms. The purpose of the Group was to review measures used in periodic medical examinations of workers to detect early health impairment, and to make recommendations to Governments and WHO on the development of this field of preventive medicine. The Report does not propose standards, but only preliminary guidelines for use in occupational health practice.

The effects of work environment or workload vary in the extent to which they affect the worker's functional capacity, and the Report discusses the relevance of some of them to health and the differences in response that may be expected in different subjects following similar exposure. In discussing health impairment it introduces the concept of overload and underload; the former representing the presence of hazardous factors, such as toxic agents, noise, or fibrogenic dust, and the latter representing the absence or deficiency of environmental factors such as lack of sufficient muscular activity, deprivation of communication with other people, lack of variability in work tasks and lack of intellectual challenge. It is admitted that relatively little is known regarding the health effects of underload.

The Group considered the validity of tests to be applied in periodic health examinations of workers and agreed that their sensitivity and specificity should be quantitatively determined. Criteria for the selection of tests and the uses of cross-sectional and longitudinal studies are reviewed. Attention is also drawn to areas in which further knowledge is needed.

To be critical, this Report attempts to cover too much in too technical a manner

in too small a booklet. This concentration together with the fact that it is written by a committee does not make for easy reading. The booklet is not well balanced; some parts are abbreviated, for example the health effects of psychological factors are dealt with in 15 lines whereas the early detection of health impairment due to carbon disulphide is allotted eight pages. It is surprising that a WHO booklet published in 1975 does not give biological measurements in SI units.

However, I consider that this Report has an important contribution to make and is essential reading for those physicians responsible for planning occupational health programmes which include the early detection of health impairment.

E. S. BLACKADDER

Elementi di Tecnologia Industriale a uso dei Cultori di Medicina del Lavoro. (Elements of Industrial Technology of use to Experts in Occupational Health). By Francesco Candura. (Pp. 823; no price stated). Aurora: Pavia. 1975.

In modern civilisation the increase and diversification of technological processes represent an important characteristic. Knowledge of technological processes in general and in detail will help various experts in the field of occupational health and safety to evaluate and prevent risks and hazards in modern industry. On the other hand, technical experts engaged in the industry have also to be aware of these risks and hazards and to avoid them by proper measures in the planning and development of technological processes.

This book by Professor Candura provides essential information for both categories of experts. Its material is organised in such a way as to give a very clear picture on each point. The author describes in detail technological processes in various branches of industry, pointing out the risk of injury or of dangerous exposure to physical and chemical agents in each phase of production, and the book thus comprises a link between technology and occupational safety and health.

The chapters are concerned with the technological processes of all important branches of modern industry such as primary materials, extraction, energy production, ceramics, chemicals, metallurgy, plastics, textiles (natural and artificial), dyes, the food industry and even printing.

Processes are described clearly using chemical formulae and diagrams. For

each step risks and hazards are listed briefly, and diagrams of machinery help to indicate possible sources of risk.

Undoubtedly this book would be of use to all experts in the field of occupational safety and health and also to technical industrial experts; it is a pity that only those with a knowledge of Italian will be able to benefit from it.

DUŠAN DJURIĆ

Plutonium—Health Implications for Man: Proceedings of the Second Los Alamos Life Sciences Symposium, May 1974. Edited by J. W. Healy. (Pp. 639; £10.00.) Pergamon Press: Oxford.

The introduction reflects the prevailing feeling of unease. 'Plutonium is one of the most controversial elements which nature has given to man. It elicits feelings of hope and awe on the part of those who see its benefits . . . and feelings of concern or fear to those who see only the potential harm'. Legitimate public concern will not be allayed by Dr. Harold Agnew's heavy emphasis on the decisive role of 'competent technical people who don't panic'.

The symposium is concerned, first, to assess the quantities to be dealt with. By the end of the century the projected annual plutonium production is of the order of 100 tonnes with activity 10^8 curies (US figures are given throughout). Though the comparison may be facile, it is salutary to reflect that the maximum permissible body burden (for occupationally exposed persons) is of the order of 10^{-7} curies and that the half-life of plutonium-239 is 24 000 years. Strict and long-term control of dispersal of the material is therefore essential. An historical account of the development of techniques for confinement of contamination is followed by a look forward to the problems of managing 25×10^6 litres of solid high-level waste, producing altogether 200 megawatts of heat.

There are eight papers on plutonium in man, chiefly concerned with toxicity and the setting of safety standards, either by calculation of radiation dose to a critical organ or alternatively by the more empirical methods of the chemical toxicologist. The inestimable value of continued study of persons with measurable radium and plutonium burdens is stressed.

The last six papers deal with plutonium in the environment and include recent studies at Bikini and Enewitok atolls. Reoccupation of the islands may result in significant dosage, perhaps 80 rems in 30