necessity of proper integration between the clinician, statistician, and experimentalist. Another very valuable feature is that the author, as well as giving a wealth of factual material, has not hesitated to give his own critical assessment of experimental methods and conclusions, thus giving the book a personal character and, incidentally, making it much easier to read than many compendiums written by multiple authors. Emphasis is placed on the importance of approaching chemical carcinogenesis both from the chemical and the biological standpoint, and Dr. Clayton, in his final paragraph, gives a very necessary warning which seems worth quoting verbatim:— "It is difficult for the chemist to judge how soundly a biological fact or opinion may be based and it is equally difficult for the biologist to evaluate chemical evidence. Therefore, if the subject is to progress, it is necessary that every individual worker should avoid placing more emphasis on his conclusions than the experimental methods justify, and he must resist the temptation to read more into the observations of other workers than the original authors claim." This statement illustrates the carefully critical spirit in which the book is written.

Obviously, when such a large field is covered, a reviewer will be struck by omissions in the chapters dealing with his own special interests. A case in point is the absence of any reference to the work of Druckrey and his group on carcinogenesis by the nitrosamines, apart from one item in the list of additional references.

After an introduction largely concerned with definitions, there is a useful chapter on occupational and environmental carcinogenic hazards with a well balanced discussion on lung cancer and tobacco smoking. Two chapters follow on methods of testing for carcinogenic activity and their interpretation with emphasis on the problems of adequate control experiments and the importance of proper statistical evaluation. After this the various types of carcinogen are considered in detail in separate chapters including macromolecules and plastic films, inorganic chemicals, aromatic hydrocarbons, alkylating agents, aromatic amines, azo compounds, and the liver poisons. As might be expected, the chapter on aromatic amines is particularly good. A careful discussion of the two-stage theory of carcinogenesis follows which the author concludes to be an important step towards the understanding of carcinogenesis but emphasizes the necessity for further work in tissues other than skin. A good account of the role of hormones in carcinogenesis is then presented, and the binding of chemical carcinogens to proteins is discussed. The pioneer work of the Millers on protein binding is thoroughly covered and there is a good account of their later work and that of others. The important conclusion (p. 377) is drawn that in the event of interaction between a carcinogen and the genetic material of the cell as well as with proteins, reaction with the latter is not necessarily unimportant.

The chapter on chemotherapy of cancer is of a rather lower standard than the others, and since the field is so enormous it might be considered in subsequent editions whether this subject really falls within the scope of the book. Theoretical aspects of carcinogenesis are discussed in the penultimate chapter. The somatic mutation

hypothesis is thoughtfully appraised with emphasis on the distinction between scientific evidence and speculation on this rather controversial topic. The immunological concept of cancer is discussed and the evidence for and against antigenic simplification in carcinogenesis is critically assessed. In the final chapter Dr. Clayton sets out his personal conclusions on future trends in the study of chemical carcinogenesis in which he states that the two questions of paramount importance are practical ones, namely how may cancer be prevented and, when it has arisen, how may it be cured. The role of the scientist in the instruction of the public on environmental carcinogenic hazards and in the possible drafting of protective legislation is underlined. He also stresses the value of the experimental method and gives his own views on profitable lines for future research concluding with the caveat on errors of interpretation mentioned above.

This is an excellent book and can be recommended to all concerned with cancer research who have an interest in chemistry.

P. N. MAGEE

Industrial Accidents Sickness and Other Absences. (Tavistock Pamphlet No. 4). By J. M. M. Hill and E. L. Trist. (Pp. 58; illustrated. 5s.) London: Tavistock Publications. 1962.

This pamphlet is a reprint of two papers on absenteeism in a large iron and steel works which appeared in the journal *Human Relations* (1953). The first paper shows the need to develop a social psychological approach to the question of industrial accidents, which may be considered as a means of withdrawal from the work situation. The various types of accidents and absences of a group of workers amongst whom there was no labour turnover for four years were studied and evidence of social patterning shown.

The second paper considers the level and type of absences for the same workers over their first four years of service and contrasts these with the overall figures for the firm. Changes in the type of absence were noted, and these were explained as reflecting changing relationships of the workers to the firm.

The reader who is interested in this ingenious way of looking at the problem of absenteeism should take note that a later paper in the same journal (P.F.C. Castle, 1956) reports findings which suggest that some modification of these views may be necessary.

C. K. ELLIOTT

The Diseases of Occupations, 3rd enlarged and revised ed. By Donald Hunter. (Pp. xvii + 1180; 455 figures. 147s.) London: The English Universities Press. 1962.

This is the classical textbook of industrial medicine. It was first published as recently as 1955 and the production of the third edition in 1962 evidences the demand for and value of this book. Industrial medicine is the application of medicine and all related sciences to industrial problems. Even in this large work all cannot be included, and the author wisely adheres to clinical aspects and refers only briefly to applied psychology, anthropology, and ergonomics. For the study of such problems as personnel selection and the human effects of automation the reader must seek elsewhere.

A magnificent account of the early history of the medical aspects of occupations, *Man and His Work*, is followed by a description of the industrial revolution and social reforms in the nineteenth century. The crisp sub-headings show the existing character of the book, e.g. Greek Prejudice against Manual Labour; Evil State of the Towns; The Sweating System; and The Climbing Boys. Later chapters describe the health of the worker in the twentieth century with succinct accounts of legislation and the development of the social services as they affect people at work. The description of toxicology, diseases due to physical agents, the pneumoconioses, accidents, occupational cancer, and occupational diseases due to infections are clear and adequate. Numerous references for further study are given at the end of each chapter. The extracts from the works of nineteenth-century novelists and poets are well chosen and have no doubt stimulated many readers to turn to the original volumes. Perhaps the quality that is most apparent is *enthusiasm*, strongly imparted by this book, which is so much more of a joy to read than multi-author works. Dr. Hunter gives full acknowledgment to his colleagues but it is his own drive and enthusiasm that are evident in the style and make the book such a delight to read.

This third edition contains numerous additions and amendments, with additional illustrations. It is a wonderful collection of occupational health lore, with the emphasis on the clinical aspects. The index is now very good indeed—65 pages of it, covering some 9,000 items!

Strongly recommended, this is now the standard work on industrial medicine for those entering a career in this branch and for the many general practitioners who undertake part-time factory work.

L. G. NORMAN

Études de Physiologie et de Pathologie du Travail. (Pp. 630; illustrated.) Luxembourg: Communauté Européenne du Charbon et de l'Acier. Haute Autorité. 1961.

This massive volume is an account of 166 research projects sponsored by the High Authority during its first four years of effective operation. The subject matter ranges from dust retention in the lungs and its physiological effects to rehabilitation and the effect of noise and high temperature on performance. The work was carried out at 72 centres whose activities were not initially co-ordinated. There was therefore need for standardization of techniques, definition of problems, and preparation of integrated programmes for research. This ground work does not appear to have been carried out. In particular there is no evidence that the High Authority is planning epidemiological surveys which experience in this country has shown to be essential both to describe the effects on health of components of the mining environment and to judge the effectiveness of remedial action.

The account is uncritical and on the relatively few occasions when reference is made to authorities outside the Community the sources are not provided. For example, no reference is given for the internationally agreed I.L.O. radiological classification of coal-workers' pneumoconiosis, and it is remarkable, when considering

the physiological changes accompanying pneumoconiosis, that no mention is made of the work of the Medical Research Council, Pneumoconiosis Research Unit. The book, which is in French throughout, contains no summaries and there is no acknowledgement to the other languages used in the Community, except in the appendix where titles are given to 304 publications on which the report is based. Many of these papers are summarized more critically in numbers of the *Bulletin of Hygiene*, and for fuller details the original articles should be consulted. The present account cannot be recommended except to medical historians, and there is real doubt if the money and effort put into its preparation was worth while.

J. E. COTES

Some Social and Industrial Implications of Shift Work. By James H. Downie. (Pp. 24; 3s. 6d.) London: Industrial Welfare Society. 1963.

This is a summary of an investigation by study groups which were formed by the United Kingdom members of H.R.H. The Duke of Edinburgh's Study Conference, 1956.

It summarizes the views of a number of these groups and individuals from a wide variety of areas of Great Britain and Northern Ireland and more than 100 questionnaires completed by shift workers in various industries in the Leicester area.

A report on a subject such as this is bound to be diffuse because of the number of factors involved, but it summarizes in a useful form all the views and prejudices which are common on this subject.

It points out that there is no direct evidence that shift work harms health, but without stressing the possibility that this is because those who are affected by shift work either do not enter shift work jobs or quickly leave them.

The conclusions are that shift work mainly affects the social well being of those involved in it.

This will be a useful booklet for management and doctors in those industries where shift work is being increasingly introduced.

P. A. B. RAFFLE

Lehrbuch der Arbeitsmedizin. Band i. Allgemeine Physiologie Pathologie—Fürsorge. (Textbook of Occupational Medicine. Vol. i. General Physiology Pathology—Welfare.) By Dr. Franz Koelsch. (Pp. viii + 748; DM 99) Stuttgart: Enke. 1963.

This is the first volume of a revised edition of Dr. Koelsch's textbook previously published under the title *Textbook of Occupational Hygiene*. At first sight, it seems a formidable tome for in its 748 pages there are no illustrations and few tables. However it makes very easy reading, partly because the author's style is direct and partly because the book is written for laymen interested in the workman's health, as well as for doctors working in industry.

The early part of the book is concerned with the physiological aspects of the worker's relationship to his work. It goes on from a definition of the normal man to discuss many familiar problems such as fatigue, job selection, and juvenile employment. In regard to the latter the theme is in the saying "A farmer would not think of yoking a foal or a calf to the plough". The