The author appears to have succeeded well in his aim 'to cover all the important papers on the subject as completely as possible', and the volume will undoubtedly constitute a valuable source of reference to both 'western' and Russian work carried out up to 1960. There is a short section (eight pages) on the deposition of aerosols in the respiratory system. Only a few Russian references are quoted in this context, relating mainly to the effects of electric charge on the particles.

A few errors have crept in, *e.g.*, the term $Re/24$ in equation (10.5) should be inverted. A few conclusions can be questioned, *e.g.*, the most suitable sizes of water drop for the capture of aerosols (page 323) have almost certainly been underestimated as a result of the assumption of potential flow. However, such minor points detract little from a first-rate book which can be wholeheartedly commended to all who wish to acquire a scientific understanding of the behaviour of airborne particulates.

W. H. WALTON

Man in his Working Environment. Ergonomics.

By K. F. H. Murrell. (Pp. xix + 496. 141 figs. 63s.) London: Chapman and Hall. 1965.

During World War II the three armed forces put a good deal of effort into improving the fit of machine to man, and when the war was over many of those who had been working in this field met together in Oxford and 'Ergonomics' was born. From the start the author of this book, K. F. H. Murrell, took the lead. Now it is a pleasure, especially for an ex-patriot west countryman, to review it, since it is written from a village placed in the Mendip Hills of Somerset.

Let it be said straight away that this is a good book, worth possessing by persons or organizations concerned with industrial or commercial employment. It should also find a place on the library shelves of teaching departments of anatomy, physiology, and psychology, all of which are now beginning to look beyond the classically academic confines of their subjects.

The book is divided into four sections. The first deals with the structure and function of the human body; the second discusses the design of equipment, seating, display indicators, and control handles; in the third section, the tolerable limits of temperature and humidity, noise and vibration, and lighting are described; and the last section sets out the methods of investigating, organizing, and inspecting work. In addition, this book contains chapters on shift work and the effect of increasing age on performance, the gist of which is to confirm what the reviewer's father told him as a boy—that 30 is the best age of a man's life. There is a full list of references, together with an adequate author and subject index. The book is rather thicker than one which usually goes under the name of handbook, but it is well within the limits of what our German colleagues would consider appropriate to this sobriquet. It is of convenient size and lies open, even when new, at the chosen page. The print is comfortably large and clear even to one with ageing eyesight. On taking off the loose cover, the spine displays both title and author's name in large,

glossy attention-catching lettering, as is often employed on books from a transatlantic country where nearly all ergonomists are, in fact, psychologists.

An author of books reviews the work of another author with much additional interest, knowledge, and charitable understanding. Mr. Murrell writes clearly and has practical and personal experience of an unusually large proportion of what he is writing about. His written words are a good deal easier to understand than some of the schematic and symbolized diagrams. But this slight difficulty in comprehension may merely be due to the process of ageing in the reviewer who, at over 50, must now be judged by the severe criteria laid down in some experiments cited in the book to be a 'slow, forgetful, half-blind, half-deaf, palsied character, of little use'.

When the time comes for a second edition one or two things might be worth reconsidering. The division of the contents into two parts, the first of which is entitled 'The Elements of Ergonomic Practice', is strange when it consists, in fact, of five chapters which describe human structure and function and one chapter on 'Man as a System Component'. Prefaces, introductions, and summaries are the most difficult parts of a book to write. Very few authors of books or papers are honoured by having their introductions off-printed as separate papers, unlike musical composers and their overtures, and in this book the author is much less happy in his preface and introduction than anywhere else, with, for example, his overworking of that undergraduate word 'factor' and his use of the word 'conditions' four times in one paragraph. But these are petty points which do not detract at all from the good value of the main body of the work. Probably only those rare, rather odd birds, who regard writing introductions as a challenge to their skill in designing a component in the chain of a communications system, actually read them.

R. C. BROWNE

Neurological Surgery of Trauma. Editor-in-Chief: Colonel J. B. Coates, Jr., M.C., U.S.A. Editor: Arnold M. Meirowsky, M.D. (Pp. 601 + xxxi; illustrated; \$6.25.) Washington, D.C.: Office of the Surgeon General, Department of the Army. 1965.

Writing a textbook has this much in common with taking a photograph, that even if you have two quite fascinating subjects in your sights, you must concentrate on one of them, if necessary at the expense of the other.

This excellently produced and carefully edited book was designed primarily as a record of the experience of the United States Army Medical Corps in the Korean War (1950-52). Its gestation period has been long; for although the editor's acknowledgements are dated 1960, it was only published in 1965. For this reason, although the half of the book which is devoted to describing the organization of neurosurgical units in the Far East and the management of penetrating wounds of the head and spine makes fascinating reading not only for the neurosurgeon but for all who are interested in traumatic surgery, much of the rest of the book has a frankly old-fashioned flavour. It was obviously well worthwhile to take time in collecting as complete as possible a record

of how the neurosurgical services were organized, and how the casualties were treated, even at the expense of allowing current events to turn into modern history. But when he comes to those sections which are devoted to the problems of traumatic neurosurgery which are always with us, the reader expects and feels entitled to demand a review of current knowledge and practice. Unfortunately, he does not get it. For example, the most recent paper quoted in an article on cervical disc derangement is dated 1953, on lumbar discs 1952. Such advances as functional radiology (*i.e.*, films taken at the extremes of movement) of the lumbar spine in the diagnosis of disc lesions are not mentioned, and the last reference to the recently revived controversy on whether to fuse or not to fuse the spine dates back to 1947. Similarly, a scholarly review of the problem of spasticity makes no mention of the intrathecal injection of phenol though this is a most important part of present-day therapy for this condition; and finally, there is no discussion of recent work on peripheral nerve conduction and regeneration.

These comments imply no criticism of the authors of the sections concerned, one of whom is now dead, for the internal evidence suggests strongly that when they were written these chapters were entirely adequate. But the result of the delay in publication has been to lessen their value to the reader. So our final verdict must be that although in places Dr. Meirowsky's compilation has the features of a classic, elsewhere it presents the symptoms of progeria. For so large and freely illustrated a book, the price is remarkably reasonable.

A. N. GUTHKELCH

Hyperbaric Oxygenation. Proceedings of the 2nd International Congress, Glasgow 1964. Edited by I. McA. Ledingham. (Pp. 472; illustrated; 70s.) Edinburgh and London: Livingstone. 1965.

In a paper to the First International Congress on Hyperbaric Oxygenation held in Amsterdam in 1963, one of the participants compared the therapeutic use of hyperbaric oxygen to the introduction of blood transfusion and antibiotics. Whether or not one agrees with this estimate of the importance of the technique, one must recognize that the use of hyperbaric oxygen is being explored with great enthusiasm, particularly in the United States, and that the possibilities of treatment with oxygen at pressures in excess of atmospheric, which have been explored periodically for about 300 years, are now again being intensively investigated. In the British Isles, Scotland is in the forefront of this activity, with its centre in Glasgow. Already the Third International Congress has taken place this year in America.

Readers of this account of the Second Congress will discover that there are highly complex problems involved in the use of hyperbaric oxygen for research or treatment and as an adjunct to surgical procedures. The therapeutic use of hyperbaric oxygen, particularly in the surgical treatment of patients, demands an elaborate installation and adequate laboratory facilities, so that the initial and running expenses are heavy. It is only the patient who breathes oxygen, and the surgeons, nurses, and technicians breathe compressed air, and they are,

therefore, compressed air workers. The first two papers in this conference appropriately describe some of the dangers to which these compressed air workers may be exposed at the pressures which are conventionally used at present. Apart from acute decompression sickness, they might also be prone to aseptic necrosis of bone at a future date, so that a high standard of medical care is required for staff. Oxygen poisoning is one possible risk to the patient, although the danger is probably small at the pressures normally used hitherto because of the relatively short period of exposure. Another paper reports impairment of ability to carry out unfamiliar tasks speedily at pressures in the range now being used in hyperbaric chambers. It is possible that this might affect the ability of surgeons working in compressed air to react as competently to new situations as they would do at normal air pressure.

There are sections on respiratory physiology and disease, surgery, cerebrovascular physiology, and disease in relation to exposure to hyperbaric oxygen. The section on 'Treatment of Infections' suggests that *Clostridium welchii* infection responds dramatically to hyperbaric oxygen, and that it is lifesaving. On the other hand, reports on the treatment of myocardial infarction and shock are not encouraging.

This book gives an indication not only of the range of enquiry and intensity of present research but also of the uncertainties which exist in this field. It is too early to say what place, if any, this form of treatment will have. It is noteworthy that there is no reference to the treatment of carbon monoxide poisoning, in which it has been claimed that hyperbaric oxygen is effective. The clinical value of this form of treatment still remains questionable, as do the advantages and disadvantages of small, inexpensive, hyperbaric chambers for one patient, compared with the large expensive chambers suitable for operative surgery.

It is clear that much more basic work is required on this fascinating technique and, in the meantime, the health of those who enter hyperbaric chambers to carry out any procedures, as well as the safety of the patient, are a matter of concern.

R. I. McCALLUM

Rochdale Industrial Health Service. Second Annual Report 1964. (Pp. 19.) Belfield Works, Kenworthy Street, Rochdale, Lancashire.

The second annual report of the Rochdale Industrial Health Service is an encouraging record of progress. By the end of 1964 the membership had increased to 18 firms with a total of 5,250 employees. The service, which is initially supported by the Nuffield Foundation, will be self-supporting by 1967 if the expected rate of growth is realized. Plans are well advanced for the erection of a permanent headquarters in a good position in the town.

Thus the newest of our industrial medical services enters its third year firmly established. It is already an essential part of the industrial life of the Rochdale district, and increasing awareness of its existence and its achievements will ensure the further growth of the service which the organizers rightly anticipate.

T. S. SCOTT