patibility. The temporal relation in the fall in PEF and arterial oxygen tension during haemodialysis, confirmed by Dr Wu and his colleagues, supports our initial contention that changes in PEF may be due to the activation of inflammatory mediators consequent on the activation of complement, neutrophils, monocytes, and platelets after the blood-dialyser interaction, resulting in an increase in pulmonary arteriolar tone and ventilation-perfusion mismatch and a reduction in tissue oxygen delivery.¹ This is supported by data obtained during the reuse of cuprophane dialysers, when the expected fall in PEF² and arterial oxygen tension and increase in platelet activation were much less than when the dialyser was used the first time.³

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Topical nasal anaesthesia for fiberoptic bronchoscopy

We would strongly support the conclusion of Dr AR Webb and others (August 1989;44:674-5) that lignocaine gel is preferable to lignocaine spray as a topical nasal anaesthetic for fiberoptic bronchoscopy. We suspect that any physician who has applied both agents to his own nostrils would agree with this suggestion as the spray preparation tends to cause an unpleasant stinging sensation when it comes in contact with the nasal mucosa. We have used lignocaine gel for many hundreds of bronchoscopic procedures with few complaints of discomfort from patients.

The technique which the authors used to apply the gel to the nose does, however, seem somewhat laborious. Although the revised technique described in the discussion section of the paper is more convenient than that used in the trial, we can recommend an alternative technique for gel application which we have found to be both convenient and effective.

We use a 12.5 cm hollow plastic applicator (Everett, Kwill) to draw up 10 ml of lignocaine gel from its tube into a syringe. The same applicator is then used to inject 5 ml of gel into each nostril. The 4 mm diameter applicator can easily be advanced to any desired depth within the nasal cavity, whereas the conical applicator on the tube of lignocaine will barely enter the anterior nares. We ask the patient to sniff, while occluding the opposite nostril, as the gel is applied, and we find that some of the gel is drawn into the pharynx, where it seems to provide useful preliminary topical anaesthesia before the introduction of the bronchoscope.

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We were interested to read the article by Dr AR Webb and others (August 1989;44:674-5) showing patients' preference for lignocaine gel over lignocaine aerosol for topical nasal anaesthesia preceding fiberoptic bronchoscopy. Seven years ago we reported the same preference for lignocaine gel by patients and normal subjects.¹ Nasal anaesthesia was equally effective with these two different methods, but the use of the aerosol was often associated with considerable nasal discomfort, an unpleasant taste, and epiphora, which did not occur with the gel. The additional advantage of the lubricating effect of the gel in passing the bronchoscope noted by Dr Webb and colleagues was also reported in our study. Furthermore, in our study plasma lignocaine concentrations were also measured to evaluate the safety of these different methods of administering lignocaine in both patients and a group of 10 normal subjects. Plasma lignocaine concentrations were lower after the same dose of lignocaine gel by comparison with the aerosol, suggesting that the gel might also be safer in terms of lignocaine toxicity.

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- 1 Efthimiou J, Higenbottam T, Holt D. Plasma concentrations of lignocaine during fiberoptic bronchoscopy. *Thorax* 1982;37:68-71.

AUTHORS' REPLY We agree with Drs O'Driscoll and Webb that users of lignocaine gel for topical nasal anaesthesia may develop their own techniques for applying the gel. Indeed, some bronchoscopists in our own unit use a syringe based method similar to the one they describe. The technique documented in our recent publication has, however, been misinterpreted. The same technique is documented in both the "Methods" and the "Discussion" sections; it is the detail which is different in the two sections. We can assure readers that it is no more laborious to inject the gel from tube to nostril and massage it posteriorly than it is to open a syringe and Everett Kwill, draw the gel from the tube to the syringe, and then inject. It is also a little cheaper and, as our data show, provides effective topical anaesthesia.

We are grateful to Drs Efthimiou and Higenbottam for bringing their paper to our attention. The peak plasma lignocaine concentration in the nine patients given gel was reported to be not significantly less than the concentration in the 32 patients given lignocaine spray, though a lower peak plasma concentration was noted in volunteers given lower dosages of spray and gel. Thus lignocaine gel is at least as safe as lignocaine spray. These authors suggested a preference by patients for the gel in the discussion of their paper, and we have now measured the preference with a randomised study focusing on acceptability to patients.

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Disturbance in respiratory mechanics in infants with bronchiolitis

I have read the report by Dr J Seidenberg and others (August 1989;44:660-7) on lung function in infants with bronchiolitis with considerable interest given our own studies in this field.¹ Whereas their results relating to forced and passive expiratory flow are certainly in line with what we expect in this obstructive lung disease, it appears that they, like us,¹ are in fact finding surprisingly low values for thoracic gas volume (TGV). It is true that in the acute phase their average TGV was 130% of predicted and in the chronic phase 126% of predicted, but the scatter was wide (see their SEM values) and several infants must have had values in or below their normal range. In our study in the chronic phase we noted many infants with TGV values below our normal range,² which is somewhat higher than the normal range used by Dr Seidenberg and his colleagues. Given the differences in normal range I suspect that the two studies contain an appreciable number of bronchiolitic infants with surprisingly low TGV values. They do not really come to grips with the thorny problem of whether or not TGV measurements are reliable in bronchiolitis. How, for example, do they know that all their values (both the high and the low) in the acute and chronic phases are not underestimated? I was delighted to see their results, which seem to confirm our own anxieties and suggest that our results were not simply an artefact. I should be most interested in their further thoughts on this issue.

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- 1 Godfrey S, Beardsmore CS, Maayan Ch, Bar-Yishay E. Can thoracic gas volume be measured in infants with airways obstruction? *Am Rev Respir Dis* 1986;133:245-51.
- 2 Quanjer PH, Stocks J, Polgar G, Wise M, Karlberg J, Barsboom B. Compilation of reference values for lung function measurements in children. *Eur Respir J* 1989;2(suppl 4):184-261S.

Adverse effect of additional weight on exercise against gravity in patients with chronic obstructive airways disease

The conclusions of Dr C R Swinburn and others (September 1989;44:716-20) can be derived from common sense and an elementary knowledge of physics.

Acceleration or deceleration of a mass requires a force. If the mass is increased, a greater force is needed for the same acceleration. Alternatively, if the force is unchanged, less acceleration is produced ($\text{force} = \text{mass} \times \text{acceleration}$). In man the force is produced by muscle contraction, which uses energy. The energy is proportional to the force produced. When one walks at a steady pace, the legs alternately accelerate and decelerate but the body does not. Therefore the wearing of lead aprons will not substantially increase energy requirements, unless they are worn on the legs, not the thorax. Clearly, in step testing the whole body accelerates and decelerates in a vertical plane against gravity. So the wearing of lead aprons will make a difference to energy expenditure and hence oxygen consumption during this form of exercise.

What does surprise me is that your journal has devoted five pages to such a straightforward matter.

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AUTHOR'S REPLY We thank Dr France for his lesson in basic physics but we fear he has missed the main point of our paper. The effects of added weight on oxygen consumption ($\dot{V}O_2$) and ventilation ($\dot{V}E$) during exercise against gravity are, of course, predictable in *qualitative* terms. Our study was, however, performed to assess *quantitatively* the impact of a modest acute increase in weight on the exercise capacity of patients with varying severity of airways obstruction. The metabolic and ventilatory measurements were necessary not, as Dr France implies, to restate the obvious, but to show that the maximum $\dot{V}E$ and $\dot{V}O_2$ achieved during weighted and unweighted exercise were similar. The conclusions of the study would have been invalid if this were not the case.

The findings of the study are potentially relevant to large numbers of patients: they suggest that modest weight reduction may be advantageous even to patients who are only moderately overweight. In addition, the results are relevant to the inevitable additional weight imposed on such patients when portable oxygen devices are prescribed. We make no apology for reporting such a "straightforward" study.

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BOOK REVIEWS

High Altitude Medicine and Physiology. M Ward, JS Milledge, JB West (Pp 515; £50.) Andover: Routledge, Chapman and Hall, 1989. ISBN 0 412 29010 3.

This is a fine book, which I believe anyone interested in respiratory physiology or in climbing high mountains will wish to read and own. The authors are acknowledged experts who have not only thought seriously about the problems of high altitude medicine and physiology but have also worked and carried out experiments in high places in the field under extraordinary conditions. All three were members of the famous "Silver Hut" Expedition in the early 1960s to the Everest area and continued to be active and interested in high altitude problems. Though the book's main strength is in the chapters on respiratory physiology and the clinical problems of mountain sickness and its complications, the coverage is more comprehensive, with chapters on nutrition, endocrine and renal problems, and thermal balance and its disorders. There is a chapter on clinical lessons for patients with lung disease living at sea level. The final chapters deal with more practical problems, such as fitness for altitude, accident and emergencies, and even anaesthesia at altitude (by John Nunn). I particularly enjoyed the historical background in the first two chapters and the

historical introduction of several other sections—perhaps a hint of a volume devoted to these issues alone by one or more of the authors in the future. As an enthusiastic hill walker at lower levels in Scotland, I started to review this book on a walking holiday in Austria at an altitude where many of the problems described are just beginning. I am tempted to go even higher, and recommend this book to all with such intentions.—MFS.

Respiratory Function in Disease. 3rd ed. D V Bates. (Pp 558; £31.) Philadelphia: Saunders, 1989. ISBN 0 7216 1592 9.

The first book with this title—by J C Meakins and H W Davies of Edinburgh—was published in 1925 and listed 404 references. The first edition of the present book, published in 1961, was written by D V Bates and Ronald V Christie (a pupil of Meakins) and listed 3834 references. The authors and contributors came mostly from Montreal. This new edition, dedicated to Christie's memory, lists 5418 new references, and the author and many of the contributors are based in Vancouver. These books exemplify the way in which during the last 60 years physiological principles have illuminated respiratory disease, and fully justify Haldane's statement that "Today's physiology is tomorrow's medicine." Since the second edition there has been a change of emphasis, reflecting both the increasing interest in cellular processes in the lung and the wider application of established knowledge of pulmonary function, particularly to such subjects as occupational lung disease, sarcoidosis, and diffuse interstitial fibrosis. The book undoubtedly succeeds in its aim of aiding physicians to raise their interpretation of pulmonary function tests above a superficial level by providing and reviewing the detailed knowledge which they need. Readers familiar with the earlier editions will find that the detailed case studies, in which clinical, radiological, and functional findings were correlated, and some of the detailed descriptions of techniques, such as measurement of diffusing capacity, have not been carried forward to the new edition; but the profusion of references remains one of the most valuable features of the book. It will be welcomed by all whose work includes interpretation of the results of pulmonary function tests, and should form a part of the bench library in pulmonary function laboratories. Future editions will be needed and from the westward progress of its predecessors one may guess that the next will come from the eastern shore of the Pacific!—GJRMCH

A Colour Atlas of Asthma G M Cochrane, P J Rees. (Pp 136; £30.) London: Wolfe Medical, 1989. ISBN 0 7234 1529 3.

This book follows the general format and style of other Wolfe colour atlases. The text is kept to a minimum and is illustrated with just over 300 photographs and diagrams. The authors give a good overview of asthma, dealing in the main with clinical aspects of the disease. Do not expect to find chapters on inflammatory mediators here. Topics covered range from epidemiology and physiology to the treatment of childhood and adult asthma. The recognition of worsening asthma, the use of the peak flow meter, and self treatment regimens are given ample space. There are useful chapters with sugges-

ted algorithms for the treatment of chronic and severe acute asthma. Agents responsible for occupational asthma are also listed, along with the occupations carrying risk. Some terms are used without explanation and this may be confusing for the reader coming to asthma for the first time. The text is not referenced. The book will therefore be useful for the doctor who already has some understanding of asthma. It will then stimulate future progress in the delivery of care to the patient. In summary, the book uses pictures and diagrams more than any other text on asthma. It deals with clinical aspects of the disease and the problems encountered in treating patients. The busy doctor will be able to dip into the book and extract information quickly.—MJW

A Colour Atlas of Cardiac Surgery: Congenital Heart Disease (pp 192); **Acquired Heart Disease** (pp 165). James L. Monro, Gerald Shore. (£35 each.) London: Wolfe Medical, 1989. ISBN 0 7234 1617 6 and 0 7234 1616 8.

Both these books are direct reissues in soft back format of two titles from the series of Wolfe Surgical Atlases that were published initially in 1982 and 1984. The new format has the advantage of making the books cheaper and therefore potentially more accessible to those at whom they are principally aimed (junior doctors, theatre nurses, and medical students); but the interval of several years since publication and the absence of any revision have meant that some areas of current practice receive little or no mention. Examples of this are the use of the internal mammary artery in coronary bypass graft procedures, the increasingly widespread preference for arterial repair of transposition of the great arteries in the neonatal period, and the management of pulmonary valve stenosis by balloon dilatation. Despite these limitations, the atlases still cover a wide range of standard procedures in adult and paediatric practice, which are illustrated with photographs of a uniformly high quality. The accompanying text is lucid and explicit and, although allowance has to be made for individual surgical practice, both these books would provide the trainee surgeon or scrub nurse with valuable preparatory information before engaging in a surgical procedure. In addition, the excellent use of intraoperative photography provides a useful substrate for teaching outside the operating theatre. Given the aims and purposes of the book, however, it is unfortunate that some fundamental areas of cardiac surgical practice are not given better coverage. Although surgical approaches and cannulation techniques are covered, there is little attempt to describe the basic equipment or techniques of cardiopulmonary bypass, which is obviously an essential component of most cardiac surgical procedures. In addition, the area of myocardial protection, including topical and systemic hypothermia and the use of cardioplegia, receives little explanatory mention; the illustrations of cardioplegia administration are placed somewhat inappropriately before the chapter on the institution of cardiopulmonary bypass. Despite these limitations, both atlases provide an unparalleled visual step by step account of most routine cardiac surgical operations, and consequently provide a valuable training manual for all those interested in this branch of surgery.—MPGJ