though extensive, is nonetheless limited to the vascular afferent innervation by the composite branchial nerves, the glossopharyngeal, and the vagus.—I am, etc.,

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Spasm and Secretion in Asthma

SIR,—Dr. D. A. Warrell and his colleagues (10 January, p. 65) confirm the fact that salbutamol has a much less stimulating effect on the beta-adrenergic receptors in the heart and vascular smooth muscle than isoprenaline and that its main effect is bronchodilatation.

There is another difference between these drugs, however, which perhaps is less widely appreciated. It is that when isoprenaline is applied to the bronchial mucosa it inhibits bronchial secretions, whereas salbutamol enhances them, and for many asthmatic patients relief of bronchospasm is of little value unless it is accompanied by the evacuation of mucus. Consequently asthma can occasionally be made worse by inhaling isoprenaline not because bronchospasm is not being relieved but because the bronchial secretions have been made more tenacious. It is possible that some of the deaths which have been attributed to pressurized aerosols have been due not so much to catastrophic cardiac arrhythmias as to the plugging of the bronchi with mucus from the local action of isoprenaline on the bronchial secretions.

The same observation applies to adrenaline and atropine, which are ingredients of other pressurized aerosols. Only two drugs are free from this effect, and they are orciprenaline and salbutamol. Both of them promote the evacuation of bronchial mucus. Of the two, I would say from clinical experience that salbutamol was rather the more effective but it has the disadvantage of occasionally causing nausea.

There are a few asthmatics whose bronchospasm is not accompanied by excessive secretion of bronchial mucus and who will obtain satisfactory relief by inhaling adrenaline, or isoprenaline, but it is a good general rule that adrenaline, atropine, or isoprenaline should never be applied directly to the bronchial mucosa—I am, etc.,

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Operating-theatre Attendants

SIR,—For many years Sheffield Regional Hospital Board and the anaesthetists employed by it have been very interested in the welfare of operating-theatre attendants. These men are hard-working, keen, and intelligent members of the present day

operating-theatre staff, without whose help the service would greatly deteriorate. Their wages, however, are low and have to be made up by overtime work. No incentive is given in the form of higher rates of pay or prestige titles to those who have obtained either the certificate of competence of the regional hospital board or of the Institute of Operating Theatre Technicians. The latter has been in force for many years, but was never recognized by the previous Ministry of Health, who in H.M.(65)76¹ laid down that after a six months' course of instruction a certificate of competence could be awarded by the regional hospital boards after a suitable examination.

Sheffield was the first to initiate such a course and issue the certificate of competence. We decided that six months was not long enough to train a theatre attendant, and insist that he spend at least a year working under constant supervision and instruction before being allowed to sit the examination. He must also attend a full day release course once a week for five months. Nothing has as yet eventuated from all this considerably time-consuming work, and it is felt that it is time that some recognition was given to these men.

There is a new fear among all attendants that when the Zuckerman report² becomes implemented there will be discrimination between those who possess the regional certificate and those who have the Institute certificate. Obviously the previous Ministry of Health favoured the regional certificate, and one can but trust that those who have worked so hard to attain this will not now find that they have laboured in vain, especially as they were encouraged by the regional boards to obtain it. Perhaps a word of reassurance from whoever is responsible for such things in high quarters might not at this stage come amiss. I should be most interested to hear from anyone engaged in similar courses whether there is anything else that we can do.—I am, etc.,

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Blood Phenytoin Estimation

SIR,—Dr. F. B. Gibberd and others (17 January, p. 147) rightly emphasize the value of blood phenytoin estimation and confirm the tendency of outpatients to take less than their prescribed dosage. The serum phenytoin levels, however, which they obtained in patients prescribed phenytoin in a dose of 100-300 mg. daily are far higher than those in all previously reported studies. One of us has recently described some causes of high blood phenytoin levels¹ but it would seem to us most likely that the levels of Dr. Gibberd and his colleagues are falsely elevated—for example, by coincidental administration to the patients of drugs which interfere with the phenytoin estimation. We have measured over 600 blood phenytoin levels (using a modification of the method of Dill *et al.*²), and the results are comparable with those of previous workers. The paucity

of toxicity with high drug levels in Dr. Gibberd's study is additional evidence of falsely elevated levels; other workers as well as ourselves have found a firm relation between high blood levels and toxic signs and symptoms,³ in particular, nystagmus develops in most patients at levels of 20-25 µg./ml.

There is no doubt, however, that optimum control of phenytoin therapy should be achieved by reliable blood phenytoin estimation.—We are, etc.,

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Adrenal Function in Hypothyroidism

SIR,—An unusual cause of adrenal failure in myxoedema coma not mentioned by Dr. C. W. H. Havard and colleagues (7 February, p. 337) is adrenal haemorrhage and necrosis. I have found this complication at necropsy in two cases with myxoedema coma—one with hypothermia—and in three cases with hypothermia associated with other conditions. In none of these cases was adrenal haemorrhage and necrosis suspected clinically.—I am, etc.,

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Steroids and Sarcoid

SIR,—We were pleased to note the favourable comment (27 December, p. 757) on our article on steroids and sarcoid.¹ However, we would not agree that our "conclusions support the view that 'the only indication for the use of corticosteroids for the suppression of a [sarcoid] pulmonary infiltration is the presence of symptoms troublesome enough to warrant relief...'" Our policy is to follow newly detected cases with pulmonary sarcoidosis and to treat, regardless of symptoms, if pulmonary function, particularly the diffusing capacity, deteriorates. Symptoms are at best an uncertain measure of impairment, particularly in pulmonary disease. If one waits for symptoms in sarcoid one may be faced with irreversible changes and steroids will no longer be effective.—We are, etc.,

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Cigarette Smoking

SIR,—Dr. M. A. Hamilton Russell says in his interesting article (10 January, p. 82) "Persistent smoking is probably governed mainly by unconscious psychophysiological mechanisms. . . ." I agree that smoking is governed mainly by an unconscious mechanism.