1/6d. worth of halothane. The immediate post-operative period will thereby be more satisfactory to both patient and anaesthetist, and the whole anaesthetic a source of great satisfaction to all concerned, including the group treasurer.—I am, etc.,

Dr. G. M. EAMES.

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Education of Mentally Subnormal Children

SIR,—Not only educationalists and parents welcome the proposed transfer of responsibility for the education of mentally handicapped children. Many medical officers of health have for some years thought this to be a logical move, and the Society of Medical Officers of Health has, I believe, endorsed the principle.

In your leading article (17 January, p. 130) you misrepresented the proposal as being one to bring these children "back to the field of formal education." It results as much from the fact that good education is now far from formal as from the great strides made by doctors, psychologists, teachers of the mentally handicapped and others, so that what goes on today in a good school for mentally handicapped (the so-called "junior training centre") is indistinguishable from the activities in a good (and non-formal) school for E.S.N. children.

You also appear to envisage that existing teachers of mentally handicapped children (or "supervisors" as you call them) will be replaced by another group of teachers with "appropriate special experience." This is quite mistaken. There are no other teachers at present with experience in this field, nor with the specialized training given on the courses developed under the auspices of the Training Council for Teachers of the Mentally Handicapped, set up following the "Scott" Report in 1962.

One accepts that subsequent generations of teachers, trained alongside other teachers in Colleges of Education, may be even more expert—but this is one of the reasons for transfer.

Having said this I heartily endorse several of your words of caution. We must keep what is good in the present system and build on it. There must not be undue haste. We want existing teachers to transfer willingly and with enthusiasm—and here the Secretary of State for Education has made a regrettable mistake in his first action, by ruling that qualified teachers of mentally handicapped children will be regarded as "unqualified teachers" until they have five years' post-diploma experience.—I am, etc.,

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Berkshire.

Dialysis and Mortality

SIR,—I have read with interest the article on integrated regional haemodialysis by Dr. R. A. Branch and others (31 January, p. 291). I would like to comment on the rather high mortality in their patients on haemodialysis.

The importance of more intensive dialysis

cannot be overemphasized. Reviewing their causes of mortality, it is quite clear from my own experience that three- or even four-times-a-week dialysis has virtually eliminated death from hyperkalaemia and cardiac failure due to fluid overload. It might well be that their superior results in home treatment are due to more frequent haemodialysis, but this is not mentioned by the authors. The replacement of the external arteriovenous shunt by the Cimino fistula¹ has again in my experience virtually eliminated the medical complications associated with clotting of shunts and infections, so much so that our antibiotic bill in the last two years has been reduced by over 80%, in spite of an increase in number of patients on treatment.

One's conclusion is that with three-times-a-week dialysis and an internal fistula an improvement in survival rates is to be expected. In addition one would anticipate a reduction in medical problems, including development of peripheral neuropathy. Finally, the quality of life and degree of rehabilitation enjoyed with the Cimino fistula is greater than with the external arteriovenous shunt.—I am, etc.,

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REFERENCE

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Endocrine Dysfunction with Lung Carcinoma

SIR,—In the clinicopathological conference reported from the Royal Postgraduate Medical School (31 January, p. 281) on a patient with bilateral adrenocortical hyperplasia from an oat-cell carcinoma of the lung producing A.C.T.H. the low serum calcium level was discussed. The question of calcitonin production in addition to A.C.T.H. was mentioned, but as the parathyroid glands were of normal size this was unlikely, and patients with calcitonin-producing medullary carcinomas of the thyroid rarely show hypocalcaemia. The low serum protein level of 4.5 g. was suggested as the best explanation of the low serum calcium level of 4.4 mN., but the extremely high plasma cortisol levels might also have caused the hypocalcaemia.

We have reported¹ a patient with a bronchial neoplasm producing A.C.T.H. with hypocalcaemia whose blood calcium level became normal after bilateral adrenalectomy and a normal maintenance dose of cortisone was given. Large doses of glucocorticoids may lower pathologically raised plasma calcium levels,² and withdrawal may be followed by an increase in plasma calcium.³ In sheep from which the adrenal, thyroid, and parathyroid glands had all been removed, raising the daily maintenance dose of mineralocorticoids resulted in falls in the plasma potassium, calcium, and magnesium levels.⁴ In other patient (to be reported) with equally severe endocrine dysfunction to the first patient mentioned the hypocalcaemia remained after bilateral adrenalectomy, and subsequently she was shown to have an A.C.T.H. and calcitonin-producing medullary carcinoma of the thyroid. This patient appears to have been one in whom calcitonin was the cause

of the hypocalcaemia.

The association between adrenals and calcium homeostasis has been known for some time from the hypercalcaemia in some patients with Addison's disease⁵ and the rise in blood calcium seen on occasion after adrenalectomy. It is possible that the hypocalcaemia in the patient discussed in the clinicopathological conference was due to excess blood levels of corticosteroids secondary to gross adrenal cortical hyperplasia. I am, etc.,

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Hypertrophic Osteoarthropathy

SIR,—Professor H. E. de Wardener adduced evidence supporting the existence of a hormonal control of sodium absorption in the proximal renal tubule.¹ I would like to suggest that hypertrophic osteoarthropathy (H.O.) is a disorder of this mechanism. It has been reported in association with tumours of the nasopharynx,² oesophagus,³ lungs, pleura, and stomach; hepatic cirrhosis; achalasia of the cardia;⁴ and bronchiectasis.

Some of its features are an increased blood-flow and vascularity, especially in the limbs, oedema of the feet, ankles, and often of the hands. Removal of the primary disease (or, in the cases of inoperable lung tumours, vagal section⁶) results in immediate relief of the symptoms of H.O. It is believed that the glossopharyngeal nerve contributes to the innervation of the pharyngeal and tonsillar arteries, and that the vagus nerve contributes to the innervation of the oesophageal, pulmonary, hepatic, and gastric arteries.⁷

It is reasonable to assume that, via 9th and 10th cranial nerves, afferents reach the dorsal sensory nuclei of the vagi from which there are connexions with the hypothalamus and other parts of the brain.⁸

It is suggested that (1) some of these afferent nerves are an integral part of a sensing-system for blood volume control. (2) In H.O., as a result of reverse-flow and Venturi effects in the vessels close to the tumour or in the diseased organs (e.g., bronchiectasis), these afferent nerves are inappropriately stimulated—in effect, a localized simulation of a contraction in the extracellular fluid volume. (3) In H.O. a hormone which increases sodium absorption in the proximal renal tubule is secreted in excess by the brain.

The resulting increase in extracellular fluid would be partly counter-balanced by other factors, including the natriuretic response to atrial distension. With a normal response to increased venous return to the heart there follows an increase in the blood flow and volume in the arterial side as well as the venous side of the circulation.

One corollary from this hypothesis is that the distribution of the afferent limb of an extrarenal blood-volume control mechanism,

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.,

C. J. LEVY.

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Sheffield 5, Yorks.

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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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REFERENCE

- 1 Emirgil, C., Sobol, B. J., and Williams, M. R., jun., *Journal of Chronic Diseases*, 1969, 22, 69.

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.