acceptable—the convulsions or the toxic effects. If extrapyramidal movements do in fact represent toxic damage to the cerebellum it would seem advisable to us to discontinue phenytoin in such a case and substitute one of the other drugs in the steadily expanding anticonvulsant armamentarium.—We are, etc.,

M. H. BELLMAN
L. HAAS

Exeter

Pharaoh's Ants in Hospitals

SIR,—Further to Mr. P. L. G. Bateman's letter (18 May, p. 383) I have found the most successful means of getting rid of ants is just to pour boiling water down their point of entry, whether it be a hole or crack. After one or two applications there is no more trouble.—I am, etc.,

Q. M. ADAMS

Bodmin, Cornwall

Tunnel Tactics

SIR,—It was with interest that I read your leading article on carpal tunnel syndrome (15 June, p. 573). In particular, I note the reference to the presence of forearm and upper arm symptoms in nearly 60% of Cherrington's cases.[1] Later, the statement that "coincident clinical and radiographic evidence of cervical spondylosis is common" is made and symptoms caused by root irritation are said to be distinguishable from those of carpal tunnel syndrome on the clinical grounds of difference in pain distribution and a relationship to head and neck movement. Such a distinction may not always be possible.

Upton and McComas[2] propose that an insult to peripheral nerves occurring both in the neck and at the wrist might predispose to the development of carpal tunnel syndrome by a "double crush" mechanism. They provide electro-physiological evidence that 70% of their 115 patients with carpal tunnel syndrome also had cervical root lesions. Patients had deliberately not been excluded from their series on the basis of neck or upper arm pain. The work of Crymble[3] again suggests that carpal tunnel syndrome and cervical root lesions cannot be clearly distinguished on the basis of pain distribution. Patients with prominent proximal symptoms at least merit a complete electro-physiological investigation if not decompression at both the neck and wrist.—I am, etc.,

J. SCOTT

Department of Medicine,
General Hospital,
Birmingham

1 Cherington, M., *Archives of Surgery*, 1974, **108**, 69.
2 Upton, A. R. M., and McComas, A. J., *Lancet*, 1973, **2**, 359.
3 Crymble, B., *British Medical Journal*, 1968, **3**, 470.

Hypotension with Intravenous Salbutamol in Premature Labour

SIR,—During the course of administering salbutamol intravenously in patients with premature labour[1] we came across a side effect not previously noted.[2] A total of 32 patients have been treated so far. Salbutamol 25 mg was administered in 500 ml of 5% dextrose starting at 10 drops per minute using an ordinary intravenous infusion set. The dose was increased by 10 drops per minute every 10 minutes till 40 drops per minute was reached or the patient's pulse rate increased to 140 per minute or the contractions ceased, whichever occurred earlier.

The results so far are similar to those of Liggins and his colleagues[2] with one exception. Among the side effects noted was a drop in systolic blood pressure of over 30 mm Hg in three patients. In two patients this was controlled by stopping the drip and running in about 500 ml 5% dextrose in the course of half an hour. In the third patient the blood pressure had dropped to 90/60 mm Hg from an initial 126/80 mm Hg and the drip was continued under close supervision. There was an associated tachycardia of 120 per minute. Within half an hour the blood pressure rose gradually to 110/70 mm Hg and the drip was therefore not discontinued. All three patients were healthy, between the ages of 20 and 26, para 2 or 3, between 32 and 36 weeks' gestation, and with an initial cervical dilatation of 3 to 4 cm.

Liggins *et al.*[2] noted that the vasomotor side effects of salbutamol occur only at high doses. They used a Palmer pump to obtain an accurate, controlled dose. However, most clinical units throughout the world will only have recourse to simpler, inexpensive, but less accurate standard intravenous infusion sets, and it seems therefore that while using this technique for arresting premature onset of labour a close check on the blood pressure is advisable at least for the first hour. Despite the associated fetal tachycardia[2] the fetus appears in no way compromised, and certainly when the initial drop in blood pressure is not too great the drip can be continued under close supervision.

We wish to acknowledge the continuing help of Glaxo Holdings Ltd.—We are, etc.,

K. H. NG
D. K. SEN

Department of Obstetrics and Gynaecology,
University of Malaya,
Kuala Lumpur, Malaysia

1 Sen, D. K., and Ng, K. H., *Medical Journal of Malaysia*, 1974, **28**. 191.
2 Liggins, G. C., and Vaughan, G. S., *Journal of Obstetrics and Gynaecology of the British Commonwealth*, 1973, **80**, 29.

Duration of Action of β-Adrenergic Blocking Drugs

SIR,—Drs. P. D. Nigam and A. S. Malhotra (24 March 1973, p. 742) have reported a clinical study designed to evaluate the response of angina to pindolol. Their results suggested a carry-over effect that might be explained by a long duration of action of pindolol. Dr. S. G. Carruthers and others (21 April 1973, p. 177) presented data on the duration of action of some β-blocking drugs (alprenolol, practolol, and sotalol) and stated that more information was necessary to enable more accurate dosage schedules to be recommended. We recently supervised a study aimed at determining the oral antiarrhythmic response of sotalol (DL-4-(2-isopropylamino-1-hydroxyethyl) methanesulphonanilide hydrochloride) and also administered ^{3}H-sotalol (100 μg) to two patients to determine its metabolic profile. Information is also available concerning the distribution of sotalol in animals.[1]

Sixteen patients suffering from cardiac arrhythmias were given 100 mg of sotalol, 100 mg of alprenolol, and placebo tablets four times a day for four successive weeks under double-blind cross-over conditions. The results indicated that sotalol had an anti-arrhythmic profile similar to those of other β-blocking drugs. There was no evidence of a carry-over effect.

Sotalol has a long duration of action and Dr. Carruthers and his colleagues have shown that maximum β-blockage is not obtained with 400 mg of sotalol. This single dose level produces 11·8% protection against exercise-induced tachycardia 96 hours after administration. A single 100 mg dose (that used four times a day in this study) provides 10·6% protection 24 hours after administration, and Svedmyr *et al.*[2] have shown that after single oral doses of 40 mg of sotalol and propranolol both drugs had the same β-blocking effect against isoprenaline-induced tachycardia four hours after administration. After 24 hours sotalol still showed 50-60% protection while propranolol had no effect at this time. If these responses were related to plasma levels it is possible that over a four-week treatment period there would be evidence of accumulation. Plasma samples were accordingly taken at two-weekly intervals and the results (range at two weeks 1·14-4·05 μg/ml and at four weeks 0·83-2·47 μg/ml) indicated that plasma sotalol levels did not increase during treatment.

Tritiated sotalol (100 mg) was administered as a single dose to two patients and provided peak plasma levels of 0·1 and 0·065 mg/100 ml respectively 2-3 hours after administration. The decay was biphasic—an initial rapid reduction to 0·067 and 0·043 mg/100 ml after 5½ hours and a slower reduction to 0·015 and 0·0075 mg/100 ml after 24 hours. Administration of tritiated sotalol to dogs (1·5 mg/kg and 15 mg/kg) and rats (5 mg/kg and 50 mg/kg) showed no evidence of storage in liver, kidney, heart, lung, brain, spleen, adrenals, or gonads. The amount of ^{3}H-sotalol present in muscle and fat 24 hours after treatment was less than 1 μg/g. In vitro experiments showed that sotalol is not bound to plasma proteins and the red blood cells—the plasma partition coefficient is unity.

Clinical objective data showed that 100 mg of sotalol four times a day for four weeks significantly reduced the incidence of arrhythmias and plasma analysis demonstrated that accumulation did not occur.—We are, etc.,

EDWIN BESTERMAN
C. MCCARTHY

St. Mary's Hospital,
London W.2

1 Martin, L. E. Personal communication, 1973.
2 Svedmyr, N., Jakobsson, B., and Malmberg, R., *European Journal of Pharmacology*, 1969, **8**, 79.

Folic Acid Supplements for Pregnant Epileptics

SIR,—Dr. Marion H. Hall's (22 June, p. 661) admirably concise account of anaemia in pregnancy raises two points which deserve comment. One is academic and merely a matter of setting the record straight—the attribution to us of the suggestion that the normal fall in serum folate in pregnancy is "principally" due to increased renal excretion of folate. Our paper[1] indicated only that the increased excretion, if it occurs in the presence of folate deficiency, could