contacts had no clinical or radiological evidence of disease. Two, a mother and son, developed active pulmonary tuberculosis and were treated apparently successfully with chemotherapy and discharged from the chest unit as cured years before their deaths.

Five cases of disseminated sclerosis over the years, though a fairly high percentage of my list, admittedly can prove nothing, but in my opinion they are suggestive of more than just coincidence. I think it likely that the vigorous immune reaction against a massive tubercular onslaught is directed against the lipoids of the tubercle bacillus and, having achieved its object, goes on to attack the myelin of the central nervous system, which has a similar chemical composition.—I am, etc.,

A. INGHAM

Darlington,
Co. Durham

Intravenous Glucagon

SIR,—We would like to comment on Dr. W. I. H. Shedden's letter (25 December, 1971, p. 815) concerning intravenous glucagon therapy.

Firstly, Dr. Shedden refers to experimental studies using glucagon in acute pancreatitis. "Experimental" means a procedure designed to elicit some fact previously unknown or to demonstrate a known principle, and this was not the object of the exercise. The hormone was given therapeutically because it is known that glucagon inhibits pancreatic exocrine secretion in man;¹ in addition it inhibits gastric secretion² and gastric and jejunal mortality,³ all features which are desirable to induce in patients with acute pancreatitis.

We now have results of 30 patients (10 classified as severe) with acute pancreatitis treated by intravenous glucagon at an initial dose of 1 mg intravenously and 1 to 1.5 mg four hourly for 24 to 96 hours—that is, a maximum dose of 9 mg/day. There were two deaths in the group, a mortality rate of less than 7%, in comparison to a mortality rate of 22 to 26% in most published series in Britain.^{4,5} Although further evaluation of glucagon therapy in acute pancreatitis is obviously required, in our limited experience the hormone may be of value especially if given in the early stages of the disorder.

Glucagon has also been given therapeutically by intravenous infusion in Paget's disease of bone (18 December 1971, p. 719). In this disorder glucagon given at a daily dose of 4 to 8 mg will, within days, result in relief of bone pain and rapid progression of biochemical abnormalities towards normal. The present indication for using the drug intravenously is severe bone pain, and the only alternative drug acting over a short period of time is mithramycin, a cytotoxic agent with serious side effects in man.

There is evidence that glucagon acts by both promoting bone uptake of calcium⁶ and by inhibiting bone resorption,^{7,8} so that logically the hormones may be useful in the treatment of patients with osteoporosis in the active stage, a disorder which may be complicated by severe skeletal deformities and loss of height. Since drug therapy in this condition is unsatisfactory glucagon might be indicated when the disorder is rapidly progressive.

In view of Dr. Shedden's findings we do

not wish to encourage the indiscriminate use of intravenous glucagon, but feel that under the circumstances outlined above its use is justifiable in our present state of knowledge. The side effects described by Dr. Shedden have not been described in man, but in dogs infused with 96 to 240 mg of glucagon a day, a considerably larger dose than induces a therapeutic response in man.

We would like to ask Dr. Shedden the following questions:

(1) Have serial lung biopsies been performed on the dogs given intravenous glucagon, and if so do the emboli resolve spontaneously when administration of the hormone is stopped?

(2) Is there any evidence of pulmonary emboli in dogs given less than 10 mg of glucagon intravenously per day?

(3) Do emboli occur if the large doses of glucagon given intravenously to dogs are given intramuscularly?

(4) Is 2 mg of glucagon given intravenously over a period of five minutes regarded as a safe procedure in investigation work?—We are, etc.,

JOHN R. CONDON

MICHAEL J. KNIGHT

JOHN DAY

St. George's Hospital,
London S.W.1

¹ Dyck, W. P., Texter, E. C., Lasater, J. M., and Hightower, N. C., *Gastroenterology*, 1970, **58**, 532.

² Dreiling, D. A., and Janowitz, H. D., *Gastroenterology*, 1959, **36**, 580.

³ Stunkard, A. J., Van Itallie, T. B., and Reis, B. B., *Proceedings of the Society for Experimental Biology and Medicine*, 1955, **89**, 258.

⁴ Efron, G., *British Journal of Surgery*, 1966, **53**, 702.

⁵ Trapnell, J. E., *Annals of Royal College of Surgeons of England*, 1966, **38**, 265.

⁶ Williams, G. A., Bowser, E. N., and Henderson, W. J., *Endocrinology*, 1969, **85**, 537.

⁷ Stern, P. H., and Bell, N. H., *Endocrinology*, 1970, **87**, 111.

⁸ Tanzer, F. S., Kennedy, J. W., and Talmage, R. V., *Proceedings Society of Experimental Biology and Medicine*, 1970, **133**, 500.

Selective Proximal Vagotomy

SIR,—In company with many other surgeons who are evaluating the use of proximal vagotomy with preservation of antral vagal innervation and no drainage procedure, we are disappointed to read of the relatively unsatisfactory results of this operation experienced by Mr. C. Wastell and others (1 January, p. 28).

We have also been conducting a randomized controlled trial to compare proximal vagotomy and selective vagotomy both with and without pyloroplasty. In this trial so far 18 patients have been evaluated between three and twelve months after a proximal vagotomy. In all these the reduction of peak acid output after pentagastrin has been 70%. Only two patients have had a positive post-operative insulin test between three and four months after the operation, and all patients have a satisfactory clinical result (Visick Grade 1 or 2).

However, in those patients in our trial who have had a selective vagotomy without pyloroplasty the clinical results have been less satisfactory, and in a report shortly to be published in the *B.M.J.* we give details of delayed gastric emptying and the recurrence of peptic ulcers. We feel that if the technique of proximal vagotomy is not per-

formed meticulously it is possible to damage or divide the vagal supply to the antrum and so produce a selective vagotomy rather than the intended proximal vagotomy. In an attempt to ensure that the antral vagal innervation is intact at the end of our operations, we use a modification of the electrical stimulation test of Burge and Vain.¹ If the antrum fails to contract after electrical stimulation of the vagus we would then feel that a drainage operation is advisable to reduce the risk of future peptic ulceration.—We are, etc.,

R. J. CLARKE

J. ALEXANDER WILLIAMS

General Hospital,
Birmingham

¹ Burge, H., and Vain, J. R., *British Medical Journal*, 1958, **1**, 615.

SIR,—I read the report of Mr. C. Wastell and others on selective proximal vagotomy (1 January, p. 28) with great interest. I would like to make the following comments.

This procedure is based on the hypothesis that extrinsic innervation is necessary to pyloric function and that a functioning pylorus will ensure adequate emptying of the vagotomized stomach. It has been shown experimentally in animals that the pylorus functions normally after interruption of its nerve supply.¹ If this is true in man, as seems likely from endoscopic observations, the preservation of the nerve of Latarjet becomes irrelevant.

It has also been established that the vagotomized stomach, even with the assistance of a drainage procedure, does not always empty satisfactorily. It is difficult to see how the maintenance of a functioning pylorus can overcome the inertia of the remainder of the stomach produced by selective proximal vagotomy. In two of Mr. Wastell's three cases of recurrent ulceration (two definite and one presumptive) the insulin test indicated that vagotomy was complete. This makes gastric stasis the most likely cause of the recurrence.

Pylorus preserving gastrectomy² provides an alternative method of reducing gastric acidity, while maintaining pyloric function. Its advantage over selective proximal vagotomy would seem to be the provision of an innervated stomach remnant, thus providing the necessary *vis a tergo* to secure satisfactory gastric emptying in the presence of a functioning sphincter. A preliminary trial of this procedure for duodenal ulcer has shown prolonged emptying without stasis and absence of early recurrence.³—I am, etc.,

THOMAS P. J. HENNESSY

Department of Surgery,
University College,
Cork

¹ Quigley, J. P., and Louckes, H., *Gastroenterology*, 1951, **19**, 533.

² Maki, T., Shiratori, T., Hatafuku, T., and Sugawara, K., *Surgery*, 1967, **61**, 838.

³ Hennessy, T. P. J., Weir, D. G., and D'Auria, D., *British Journal of Surgery*, 1972, **59**, 27.

The Tropical Intestine

SIR,—Your leading article "The Tropical Intestine" (1 January, p. 2) followed an article by Dr. J. M. Falaiye on intestinal malabsorption in the tropics (20 November,

1971, p. 454). I would hesitate to comment on this matter if I had first not written to him in Nigeria and obtained a reply signifying considerable interest in my suggestion.

In the first place, as your editorial pointed out, it is essential to place in a separate category those persons who have an abnormal intestinal structure and function and overt signs of disease involving the small bowel such as kwashiorkor, sprue, and coeliac disease. There remain, however, a large group of persons residing in tropical countries who show little if any signs of malnutrition, and they report no more attacks of diarrhoea than other persons who live in these areas. They constitute the puzzle. These changes in the structure and function of the small intestine are not present at birth, they are acquired by many when tropical diets are eaten, they disappear slowly if these persons go to temperate regions and take temperate diets. White immigrants to the tropics may acquire the lesion, which in them is also reversible.

The diets of indigenous persons in the tropics are often low in fats and protein. They are richer in carbohydrates, which often comprise some 60-80% of the calories. Starch is always formed within a cell; man can digest starch but not the complex group of substances in the cellular wall. This complex is called fibre, whose main constituent is cellulose, itself a variable molecule. Inhabitants in the tropics usually eat their starch surrounded with its natural complement of fibre (5-15 g/1,000 cal); their staple foods are seldom processed into fibre-free foodstuffs. White people consuming white bread of high extraction eat starch devoid of almost all fibre—naked starch.

I suggested to Dr. Falaiye that the Caucasian race has adapted to its diet by acquiring fine villi and rapid absorption of many nutrients. White persons have a higher blood sugar curve (and more obesity and diabetes), a higher serum cholesterol (and more coronary heart disease and more gall stones), and a higher serum calcium (and more renal stone) than Africans.¹ This we call "normal" absorption. We call the conditions in the tropics "malabsorption."

I suggest that many inhabitants in the tropics deal with carbohydrate metabolism in a physiological manner. The pattern of acquired disease is different in many respects in Africans.¹ So is the incidence of certain carcinomata, notably that of the large intestine,² where the fibre produces rapid transit times and bulky stools. Ulcerative colitis is extremely rare on fibre-rich diets.¹—I am, etc.,

HUGH TROWELL

Fordingbridge,
Hants

¹ Trowell, H. C., *Non-infective Disease in Africa*, pp. 464-472. London, Arnold, 1960.

² Burkitt, D. P., *Cancer (Philadelphia)*, 1971, 28, 3.

Examination of the Unconscious Patient

SIR,—Your leading article on the examination of the unconscious patient (6 November 1971, p. 313) and your enthusiasm for the establishment of stroke units in Britain are commendable.

May I recommend for further reading a paper by C. M. Fisher on the neurological examination of the comatose patient?¹ It contains much useful information, derived largely from a thorough study of patients with strokes. As such, it complements Plum

and Posner's book very nicely.² The small section which describes the movement of the eyes in the comatose patient is particularly useful.—I am, etc.,

ROBERT R. YOUNG

Department of Neurology,
Massachusetts General Hospital,
Boston, U.S.A.

¹ Fisher, C. M., *Acta Neurologica Scandinavica*, 1969, 45, Suppl. 36.

² Plum, F., and Posner, J. B., *The Diagnosis of Stupor and Coma*. Oxford, Blackwell, 1966.

Doctors and Overpopulation

SIR,—Perhaps a married couple, both F.P.A.-trained doctors, could add their own views to those of their eminent colleagues (8 January, p. 108).

We have no doubt that professional and lay workers will be delighted that so much eminence in the field of health has joined together to support a properly based birth control service. The Peel report¹ was disappointing in that the last and not the first recommendation in two pages of recommendations was for a free family planning service under the National Health Service. Dr. J. A. D. Anderson and colleagues rightly call for a service, free of charge, within the framework of the National Health Service. The F.P.A. clinical services should be absorbed into the new area health boards, but before this can occur the medical and nursing professions should put their own houses in order.

Training of all doctors, male and female, must be adequate to enable the patient to get proper advice on contraception. It is significant that more patients receive the contraceptive pill from family doctors than from the F.P.A. or the few local authority clinics, but generally speaking family doctors give little advice on other methods of contraception—e.g., the diaphragm or I.U.D., etc.

The service must be free. At the present time there is payment to the F.P.A. and payment often to family doctors for private prescriptions. The hospital service, for various reasons—shortage of outpatient space, lack of interest—rarely provides a family planning service. It is small wonder that our ex-local Member of Parliament could only get the Family Planning Act through Parliament by putting the burden of cost on the local authorities. These authorities have received some of the criticism accorded to the F.P.A., though local authorities on Merseyside have in the main given good financial support, appreciating that money spent on contraception may in the long term save money in other ways. It is significant that in the Birkenhead authority a virtually free service has attracted 600 women patients in 18 months—some receiving advice for the first time after the 7th or 8th child.

The nurses need training. A domiciliary service, of which the Department is so keen at the present, can be run properly only if all health visitors and midwives are theoretically and practically trained in contraceptive techniques. In Birkenhead, with the wholehearted support of the consultants in the specialty, the obstetric and gynaecological wards are visited every day, including Sunday, by trained community nurses to give advice. As one health visitor said "We are welcomed with open arms." Dare we suggest that the men need the advice on contraception as much, if not more so, than the women. This support from consultants is sadly lacking in some areas. What a struggle

it has been to get contraceptive instruction to the midwives, let alone the national nursing training programmes!

From practical experience of trying to organize birth control services, we know that what we need are more properly trained doctors. Perhaps the eminent doctors of the letter would ensure that their younger students, both male as well as female, are trained, by themselves if they are able to give training, and by the F.P.A. if not.—We are, etc.,

SHIRLEY NICHOLAS

PHILIP NICHOLAS

Health Department,
Birkenhead, Cheshire

¹ Department of Health and Social Security, Welsh Office, Central Health Services Council, Standing Maternity and Midwifery Advisory Committee, *Domiciliary Midwifery and Maternity Bed Needs*. Report of the Subcommittee. London, H.M.S.O. 1970.

SIR,—I suspect that those of your readers who do not support the letter from Dr. J. A. D. Anderson and others (8 January, p. 108) have not read the January issue of *The Ecologist*. The should do so at once.

While a number of the opinions and suggestions made in that journal have been questioned, virtually none of its critics has denied the need for population control. We have a world population crisis on our hands, and it is worsening rapidly.—I am, etc.,

PHILIP BARKER

Charles Burns Clinic,
Moseley,
Birmingham

Emergency Treatment of Poisoning

SIR,—On the same page (22 January, p. 242) Drs. C. J. Burns-Cox and C. J. Morley complain of a paucity of information from "the official poisons centres" about the latest chemicals and drugs, and Dr. H. J. S. Matthew, director of the Edinburgh Centre castigates the anonymous author(s) of the section on Emergency Treatment of Poisoning in the *B.N.F.* 1971. All this reflects the growing anxiety of doctors about ever increasing self-pollution by noxious chemicals and as such is in my opinion a good thing.

If the section in the *B.N.F.* (which contains a deal of common sense and which must reflect thought and effort on the part of its authors) needs revision perhaps the editorial board might invite Dr. Matthew to try his hand at it next time on the principal that "the reformed poacher makes the best gamekeeper." His advice that general practitioner's send all cases of poisoning to hospital (other than unequivocal accidents with trivial consequences) is sound, but I would like to recommend that hospital junior doctors who may be in doubt consult their works of reference (including the *B.N.F.*) and talk to their registrars and consultants before they make use of the National Poisons Information Service which is in no way a sole authority.

As to the suggested remedy for delays in circulating new information I assure Drs. Burns-Cox and Morley that, while I like their scheme at first glance, the manufacturers already provide the centres with information on new products on a voluntary basis and that this is processed and incorporated in the index as rapidly as facilities permit. During 1971 I had on five occasions only to refer directly to a manufacturer because I had no source of information readily