1:16). After the epidemic 89 (77%) had a four-fold titre rise. Of those under 20 years of age 46 out of 50 had positive titres after the infection. Clinical illness occurred in over 50% of infected subjects.

Five years later a follow-up study was done using 75-g oral carbohydrate load glucose tolerance test. Serum neutralizing antibody titres and two-hour plasma glucose levels were measured. Of the 136 persons under 25 years of age (M.= 65, F.= 71) the highest two-hour plasma glucose was 133 mg/100 ml. Persistence of positive titre levels was also documented since 77% of these subjects had a positive neutralizing antibody titre level.

Even though it was in the young diabetic that Dr. Gamble and his colleagues were able to show the strongest association with positive Coxsackie B4 titres we could not show that Coxsackie B4 infection caused a single case of diabetes, though the attack rate in the 136 under 20 years of age at the time of the epidemic was extremely high.—We are, etc.,

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- 1 Gamble, D. R., et al., *British Medical Journal*, 1969, 3, 627.
- 2 Gamble, D. R., and Taylor, K. W., *British Medical Journal*, 1969, 3, 631.
- 3 Hadden, D. R., et al., *British Medical Journal*, 1972, 4, 729.

Serotonin and the Mesenteric Circulation

SIR,—Dr. I. M. Murray-Lyons and others (29 December, p. 770) reported some unusual cases of gangrene of the small intestine in patients with carcinoid tumours of the small bowel and with raised blood levels of 5-hydroxytryptamine (5-HT). They found proliferative changes in the elastic tissue in the wall of the mesenteric vessels. Anthony and Drury,¹ reporting similar changes in the elastica in cases with small bowel carcinoid, postulated that some substance or substances produced by the carcinoid tumour caused the changes in the elastica, which in turn compromised the lumen and contributed to bowel necrosis in some cases. This hypothesis has not been proved directly. The elastica lesions have not been reproduced experimentally and the theory does not explain the presence of the elastica lesions almost exclusively in the mesenteric circulation.

In a recent laboratory investigation in dogs blood flow was measured with an electromagnetic flow meter simultaneously in the thoracic aorta, in the superior mesenteric artery (S.M.A.), and in the renal artery. An intravenous injection of 5-HT (0.03 mg/kg) caused a reduction in flow, which was most marked in the S.M.A. (fig.). The reason for this specific sensitivity of the mesenteric vascular bed to 5-HT is not known. Nor can it be stated with certainty that the human mesenteric circulation responds to 5-HT in a similar manner. However, this observation does suggest an alternative hypothesis for the aetiology of the elastica changes in the mesenteric vessels—that a continuously raised level of 5-HT in the blood may lead to a chronic increase in re-

Effect of intravenous injection of 5-HT (arrow) on flows (ml/min) and blood pressure (mm Hg).

sistance in the mesenteric circulation. The sustained increased resistance causes the degenerative changes in the elastica in the branches of the S.M.A. that in turn contribute to ischaemic necrosis in some cases of small bowel carcinoid.—We are, etc.,

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- 1 Anthony, P. P., and Drury, R. A. B., *Journal of Clinical Pathology*, 1970, 23, 110.

Serotonin Metabolism in Hepatic Encephalopathy

SIR,—We read with great interest the paper by Dr. A. J. Knell and others (23 March, p. 549) on disturbed serotonin metabolism in hepatic encephalopathy. Our interest in the metabolism of serotonin (5-HT) was aroused by a patient with cirrhosis of the liver who excreted large amounts of 5-HT and its precursor 5-hydroxytryptophan (5-HTP) in urine.¹ The hepatic metabolism of 5-HT in experimental cirrhosis was characterized by decreased formation of sulphate conjugates, increased synthesis of glucuronide and conjugates,^{2,3} decreased uptake of 5-HT by the liver,³ and deranged enterohepatic circulation of metabolites of 5-HT.^{3,4} Metabolism of 5-HT in the mucosa of the small intestine was disturbed only in the advanced stage of the cirrhosis, when the mucosa lost its ability both to store and metabolize 5-HT.³

A raised concentration of 5-hydroxyindole acetic acid (5-HIAA) in cerebrospinal fluid might well be related to increased excretion of 5-HT and 5-HTP in urine. According to our preliminary observations the storage and metabolism of 5-HTP in the small intestine mucosa of cirrhotic rats is disturbed like the intestinal metabolism of 5-HT. Thus an increased efflux of 5-HTP into the portal circulation may result in an increased transfer of 5-HTP to the central nervous system, where it is metabolized through 5-HT to 5-HIAA. This mechanism might be involved in the pathogenesis of the observed increase of 5-HIAA concentration in cerebrospinal fluid in patients with hepatic encephalopathy.—We are, etc.,

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- 1 Mustala, O., Kekki, M., and Pentikäinen, P., *Annals of Clinical Research*, 1969, 1, 197.

- 2 Pentikäinen, P., *Annales Medicinæ, Experimentalis et Biologiæ Fenniae*, 1970, 48, 135.
- 3 Pentikäinen, P., Kekki, M., and Mustala, O., *Scandinavian Journal of Gastroenterology*, 1969, 4, Suppl. 4.
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Laparoscopic Tubal Ligation

SIR,—I was extremely interested in the letter by Dr. K. R. Greene and others (6 April, p. 54). Only three days before that date and quite independently I did my first laparoscopic Pomeroy sterilization by virtually the same method as they described. I would confirm that it seems simple and safe and that a search of the literature suggests that it has not been tried previously. In thin patients with a mobile uterus there would seem to be no need for two lower quadrant incisions because a single midline stab 2-3 cm above the symphysis pubis suffices. It would seem that the main hazards of the procedure are likely to be haemorrhage due to tearing of the mesentery of the Fallopian tube and, if one uses two stab incisions, accidental puncture of the inferior epigastric vessels by the operating cannula—a complication which should be avoidable if one remembers the surface markings of these vessels. Both complications should be excluded before withdrawing the laparoscope. Neither would be as serious as bowel burns and either would be an indication for laparotomy, for which consent should always have been obtained.

In due course I too hope to report a large series of patients having a laparoscopic Pomeroy sterilization. It would seem important to make an early and full assessment of a technique which requires only ordinary laparoscopy equipment, permits tubal ligation and transection, avoids the hazards of diathermy, and is surprisingly easy.—I am, etc.,

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- 1 Greenhalf, J. O., and Roberts, H. R., *British Medical Journal*, 1971, 3, 304.

Death during Dental Anaesthesia

SIR,—I have read with interest Dr. J. G. Bourne's letter on this subject (16 March, p. 516), but I do not feel that he has adequately emphasized the fact that a young, healthy person died needlessly. The patient had an unrecognized faint during the intravenous induction of anaesthesia in spite of the presence of the cardinal sign of pallor. In spite of this pallor and while in the sitting position in the dental chair pure nitrous oxide was given. The anaesthetic was administered by an operator anaesthetist, a practice which is not supported by the Society for the Advancement of Anaesthesia in Dentistry.¹

While tragic errors of judgement have been made by most of us in the course of our professional careers we must realize that the price of liberty is eternal vigilance. I routinely anaesthetize the dental patient in the supine position, but this is purely because of the trend in dental ergonomics. I have never shared Dr. Bourne's anxiety about the sitting position and I never hesitate to use this position if the patient has, for example, a hiatus hernia or an abdominal

swelling or expressed a preference for this posture. I do, however, maintain the lower limbs in the horizontal position.

A patient can just as readily faint in the horizontal as in the sitting position. Some time ago I had a young, healthy female patient who, while in the supine position, fainted following the insertion of the intravenous needle before any methohexitone had been injected. She became unconscious, with marked pallor, a moist skin, and bradycardia. She did not regain consciousness until she was tilted into the Trendelenburg position and pure oxygen was administered. She was subsequently anaesthetized uneventfully. The important thing is to recognize a faint immediately, whatever position the patient is in, and to treat it expeditiously.—I am, etc.,

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1 S.A.A.D. Digest, 1974, 2, 103.

Mental Changes in Parkinsonism

SIR,—Your leading article (6 April, p. 1) provides an excellent summary of the frequent occurrence of dementia in Parkinsonism. It is also rightly sceptical of attributing this to cerebrovascular disease.

In describing both the common reversible and the rare permanent mental sequelae of treatment with levodopa you cite the papers of Andén *et al.*¹ and the recent report of Wolf and Davis.² It is of great interest that both papers describe cerebral atrophy demonstrated by air encephalography and confirmed at necropsy.² Evidence of diffuse cerebral atrophy in Parkinsonism has previously been adduced by Svennilson *et al.*,³ and was a not infrequent finding at air ventriculography performed prior to stereotactic surgery in the 1960s. Organic mental changes were more frequent in such patients, and evidence of primitive reflexes, especially the glabella tap,^{4,5} were common. We find therefore, a tetrad consisting of: (1) Parkinsonism, (2) dementia of varying degree, (3) primitive reflexes, and (4) cerebral atrophy. This forms a distinctive clinical syndrome, but one which is seen in the advancing or late cases of Parkinson's disease. It is not exclusive to this disease and can be found in the different clinical context of Alzheimer's presenile dementia.⁶

In a clinical study of 65 patients with dementia (mean age 61 yr; 42 male, 23 female; symptom duration 0.2 yr in 80% of patients), we found "Parkinsonian signs" in no less than 40 cases (61%) (table I). One

TABLE I—Parkinsonian Signs Present in 40 Patients Presenting with Presenile Dementia

Sign	No. of Patients
Facial Masking	30
Akinesia	18
Rigidity	22
Tremor	19
Glabella tap reflex	32

or more primitive reflexes were elicited in 32 (80%) of them (table II). Cortical atrophy or ventricular dilatation was seen at air encephalography in 92% patients, as would be expected in Alzheimer's disease.

I would emphasize that the clinical picture in those presenting with presenile dementia

TABLE II—Primitive Reflexes Present in 40 Patients with Presenile Dementia and Parkinsonian Signs

Reflex	No. of Patients
Glabella tap reflex	32
Snout/sucking reflex	26
Grasp reflex	16
Palmo-mental reflex	21

is quite distinct from Parkinson's disease in the early stages. As the two disorders progress, however, the overlap of their clinical features can on occasion be striking, though the severe tremor and flexion dystonia of axial muscles seen in Parkinsonism is not seen in those presenting with dementia. A further feature we have noticed is the singular failure of levodopa to influence the extrapyramidal disorder in either clinical context, and indeed profound depression, worsening of the dementia, and hallucinosis are liable to occur at low dose levels (0.5 to 1.5 g/24 hr).

These findings suggest the possibility that the cerebral atrophy may be a part of the primary disorder in both Alzheimer's and Parkinson's diseases; and that in the late stages there may therefore exist a *supranuclear* disorder of basal ganglia function.⁷ This may be important in modulating neurotransmission in both dopaminergic and neuromelanin granules at a lower level, as a result of the neuronal depletion and atrophy of the cortex. The lack of therapeutic response to levodopa and the "hypersensitivity" to this drug in those patients with the tetrad of features described are explicable on this basis.—I am, etc.,

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1 Andén, N. -E., *et al.*, *Acta Medica Scandinavica*, 1970, 187, 247.
2 Wolf, S. M., and Davis, R. L., *Archives of Neurology*, 1973, 29, 276.
3 Svennilson, E., *et al.*, *Acta Psychiatrica Scandinavica*, 1960, 35, 358.
4 Pearce, J., Aziz, H., and Gallagher, J. C., *Journal of Neurology, Neurosurgery and Psychiatry*, 1968, 31, 501.
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6 Pearce, J., and Miller, E., *Clinical Aspects of Dementia*, London, Baillière Tindall, 1973.
7 Pearce, J., *European Neurology*. In press.

Hangover and Testosterone

SIR,—Chronic alcohol intake is known to alter the secondary sex characteristics in men. These changes have been attributed to altered steroid metabolism in a cirrhotic liver. However, ethanol itself, without any liver damage, has been found to affect the metabolism of steroid sulphates.¹ As an extension of our earlier hangover study² we studied the effects and after-effects of ethanol on the plasma concentration of free testosterone, which, in contrast to the steroid sulphates, is a biologically active hormone.

Mean (± S.E.M.) Plasma Testosterone and LH Concentrations during Alcohol Intoxication and Hangover in 10 Subjects

Time (hr)	Plasma Testosterone (nmol/l.)		Plasma LH (IU/l.)	
	Without Ethanol	With Ethanol	Without Ethanol	With Ethanol
0	20.1 ± 2.4	18.2 ± 1.9	8.2 ± 1.6	12.1 ± 2.5
4	15.2 ± 2.1	15.9 ± 1.4	8.8 ± 2.2	9.4 ± 1.7
8	17.7 ± 2.1	17.2 ± 2.4	6.4 ± 1.3	6.8 ± 1.8
12	23.0 ± 2.0	16.3 ± 2.8	6.3 ± 1.8	7.8 ± 2.3
15	20.2 ± 1.8	10.5 ± 2.5	6.6 ± 1.6	10.2 ± 2.3
20	19.3 ± 1.6	8.3 ± 2.1	6.0 ± 1.2	12.2 ± 2.2

Ten healthy male students aged 19 to 25 volunteered for the experiment. Each received ethanol 1.5 g/kg as a 20% aqueous solution which he drank at a constant rate during a period of three hours. The experiments were started at 6 p.m. By the next morning all the ethanol had been eliminated and most of the subjects had a more or less severe hangover. Each also participated in another experimental session during which he drank water only. Thus each subject served as his own control. Blood samples for determining levels of luteinizing hormone (LH) and testosterone were taken at the start of drinking and at 4, 8, 12, 15, and 20 hours afterwards. Concentrations were estimated by radioimmunoassay.

During the period of acute intoxication there were no changes in plasma testosterone concentration, but during the hangover (12-20 hours after the start of drinking) the testosterone level was only about half what it was during the control period (table). In addition, the decrease seemed to correlate with the intensity of the hangover. The decrease was not due to inhibited LH secretion because plasma LH concentration was not decreased by ethanol. On the contrary, there was a slight increase in LH level during the hangover.

Though the biochemical mechanism and physiological significance of the decrease in plasma testosterone concentration during the post-alcoholic phase are not yet known we want to report this finding, because it indicates that ethanol can alter the metabolism of biologically active sex hormones without causing any liver damage. If the testosterone level is constantly low during chronic alcohol intake this may explain some of the endocrine abnormalities found in chronic alcoholics.—We are, etc.,

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1 Cronholm, T., and Sjövall, J., *European Journal of Biochemistry*, 1970, 13, 124.
2 Ylikahri, R. H., *et al.*, *European Journal of Clinical Investigation*. In press.

Pseudotumours of the Orbit

SIR,—I was interested to read the leading article (6 April, p. 5) on pseudotumours of the orbit. One cause of pseudotumour in the elderly, temporal or giant-cell arteritis, was unmentioned. I reviewed 43 cases of temporal arteritis and found three that had presented with proptosis and chemosis (in one case bilateral) sufficient to warrant the term pseudotumour of the orbit. Diplopia occurred in two of the cases and one of these developed unilateral blindness. In all three cases there was marked disablement and severe orbital pain.

If pseudotumour of the orbit presents in a patient over the age of 60-65 years temporal arteritis should be considered and other manifestations, especially girdle myalgia or arthralgia, sought. A raised E.S.R. may be