undiagnosed by cystoscopy and routine radiology. When symptoms are recurrent or there is proteinuria between attacks of haematuria a positive histological diagnosis is more likely and has the advantage of making repetitive radiology or even surgery less likely.

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¹ Michael, J, *et al*, *British Medical Journal*, 1976, **1**, 686.

Distalgesic

SIR,—An examination of the latest available mortality statistics¹ shows that since 1964 the decreasing availability of the traditional methods of self-poisoning—for example, coal gas—has coincided with an increase in the abuse of other agents such as psychotropics and analgesics (aspirin, paracetamol, etc), the majority of the latter being obtained from retail sources.

The recent article by Dr R M Whittington (16 July, p 172) confirms previous reports² that Distalgesic (paracetamol + dextropropoxyphene) is the most widely prescribed analgesic in the United Kingdom and it is perhaps not surprising that, unfortunately, a small minority should seek to abuse it. However, statistics³ indicate that annually many more deaths result from ingestion of aspirin and paracetamol.

The problem associated with the taking of quantities of alcohol with centrally acting drugs is well known to physicians and we stress this in our literature.⁴ However, the effectiveness and safety of Distalgesic are confirmed by its 13 years of widespread clinical use, which has shown that it does not present a problem when taken as directed.

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¹ Office of Population Censuses and Surveys, *Mortality Statistics 1974*, series DH1, No 1. London, HMSO, 1976.

² Skegg, D C G, Doll, R, and Perry, J, *British Medical Journal*, 1977, **1**, 1561.

³ Office of Population Censuses and Surveys, *Mortality Statistics 1974*, series DH4, No 1. London, HMSO, 1976.

⁴ ABPI Data Sheet Compendium, 1977.

Perforating diverticulitis

SIR,—I am prompted to write by a statement in your recent leading article headed "Perforating diverticulitis" (2 July, p 5). While agreeing that a conservative policy of management is often rewarding in inflammatory diverticular disease and welcoming the re-emergence of the old-fashioned expression "a phlegmon," I cannot accept that the use of intravenous fluids and broad-spectrum antibiotics should be advocated for an appendix abscess.

The management of two patients recently may illustrate the point. The first, a 42-year-old man, had a 3½-year history of a sinus in the right loin. A suspected perinephric abscess had originally been opened, but the drainage site had intermittently discharged. He presented several times with right iliac fossa pain and the discharging sinus, each time managed conservatively with antibiotics. Eventual laparotomy revealed an abscess

cavity around the appendix which had a chronic perforation at its centre, through which threadworms moved freely.

The second case involved a suspected carcinoma of the caecum in a 74-year-old woman. Her story of right iliac fossa pain and a febrile illness of three months before was not forthcoming until after a laparotomy had revealed an abscess cavity in the right iliac fossa. This had formed around a small bone from the flying fox (a species of bat which is a culinary delicacy here), which had perforated the caecum.

I feel that neither of these patients would have been greatly served by a regimen of intravenous fluids and antibiotics and, although not absolutely typical of the case which you presumably had in mind, serve to emphasise that adequate surgical drainage remains the basis of successful treatment of an abscess.

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SIR,—I was interested to read Mr D D Rao's report (16 July, p 192) of a solitary perforated diverticulum of the ascending colon. This is a rare condition which the average surgeon meets on only one or two occasions during his "emergency surgery period." I had the doubtful privilege of extending this period beyond all reasonable lengths and was able, in 1962, to report¹ a personal series of six such cases encountered during a 10-year senior registrar stint. The condition can occur at any age—my patients' ages ranging from 12–62—and is always misdiagnosed as acute appendicitis. On opening the abdomen a further misdiagnosis is nearly always made and a right hemicolectomy performed on the assumption that one is dealing with carcinoma. This is because the ruptured diverticulum is surrounded with a firm inflammatory exudate. I made this mistake in my first case, but in the remaining five was forewarned and was able to resect out the offending diverticulum and remove it.

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¹ Burkitt, R T, *Postgraduate Medical Journal*, 1962, **38**, 442.

Percutaneous peritoneal biopsy

SIR,—We were interested to read your leading article (18 June, p 1557) concerning abdominal tuberculosis in Britain as we recently diagnosed tuberculous peritonitis in a woman presenting with ascites by the technique of percutaneous peritoneal biopsy. The ascitic fluid contained 43 g protein/l and moderate numbers of leucocytes, but examinations for mycobacteria on direct smear were repeatedly negative. Percutaneous peritoneal biopsy was performed with an Abram's needle through a small skin incision in the right iliac fossa. Histological examination revealed caseating granulomata and large numbers of acid alcohol-fast bacilli.

It is instructive to compare the findings in this patient with those in patients with tuberculous pleural effusion, in whom pleural biopsy is positive in approximately 80% of cases, although mycobacteria are rarely seen on direct smear on pleural fluid. As far as we are aware, peritoneal biopsy is not commonly practised in Britain, although it is used more extensively in the United States,¹ where the

diagnostic yield in tuberculous peritonitis (with the blunt-ended Cope needle) is as high as 60–90%.²

In the presence of ascites percutaneous peritoneal biopsy is a safe and relatively simple bedside technique; its diagnostic yield is high and we suggest that it may be used to advantage in the investigation of ascites and particularly when tuberculous peritonitis is suspected.

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¹ Viranuvatti, V, *et al*, *American Journal of Proctology*, 1966, **17**, 488.

² Levine, H, *Archives of Internal Medicine*, 1967, **120**, 542.

Disulfiram blood levels

SIR,—Drs L Ranek and P B Andreassen (9 July, p 94) claim that "the pharmacokinetics of disulfiram have not been elucidated because there are no sensitive and specific methods of determining disulfiram and its metabolites."

Disulfiram is a very difficult drug to understand, but we have described a method of measuring blood levels clinically.¹ After oral disulfiram therapy levels of 2–8 mg/l were obtained, and immediately after implantation levels of 1–3 mg/l were recorded.³ A final metabolite of disulfiram is carbon disulphide. This gas was measured in the breath of disulfiram-treated patients and levels of 0.1–0.4 mg/m³ were obtained.³

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¹ Porter, G S, and Williams, A E, *Journal of Pharmacy and Pharmacology*, 1972, **24**, suppl, p 144.

² Brown, M, Porter, G S, and Williams, A E, *Journal of Pharmacy and Pharmacology*, 1974, **26**, suppl, p 95.

³ Malcolm, M T, Madden, J S, and Williams, A E, *British Journal of Psychiatry*, 1974, **125**, 485.

Trace elements in intravenous feeding of infants

SIR,—Your leading article "Intravenous feeding in infancy" (11 June, p 1490) quotes Fox and Krasna,¹ supporting the recommendation to supply the need for trace elements by giving "10 ml/kg fresh frozen plasma every week." Fox and Krasna, like many other authors, simply state that they rely on this procedure but do not provide any data to support its adequacy. A simple calculation based on normal plasma levels and on recommended allowances for zinc, for example, easily shows that such a procedure will scarcely change anything and will certainly not supply any substantial amounts of zinc. "Normal" adult human plasma (the source of "fresh frozen plasma") contains 960 ± 120 µg Zn/l.² Infants on parenteral nutrition require 40 µg Zn/kg/day³ or 280 µg Zn/kg/week. Thus fresh frozen plasma in a dose of 10 ml/kg/week will supply at the best 10.8 µg/kg/week—that is, only about 1/30th of the required amount.

Infants on parenteral nutrition are sick babies, not normally thriving ones. Catabolism, wound healing, and catch-up growth enormously increase the demand for zinc. It is therefore obvious that 10 ml plasma/kg/week will in no case, not even in healthy ones, supply

enough of the element. As a matter of fact many commercially available solutions and especially those of amino-acids are slightly contaminated with zinc and other elements,⁴ but the quantities present are far below actual needs. Some of the newer solutions for parenteral feeding do contain trace elements in adequate amounts, but nevertheless we still frequently have to add further 100-500 µg/day (1-5 ml of a solution containing 0.1 mg Zn/ml as ZnCl₂), mostly in surgical patients, to achieve positive nitrogen balance, normal wound healing, and growth.

Calculations of the actual amounts of other trace elements in human plasma lead to the same conclusions as to the rationale of its use as a source of trace elements for patients under parenteral nutrition. It is therefore mandatory actually to calculate even microgram amounts and stimulate the pharmaceutical industry to supply adequate solutions for general use.

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- ¹ Fox, H A, and Krasna, I H, *Pediatrics*, 1973, **52**, 14.
² Halsted, J A, and Smith, J C, *Lancet*, 1970, **1**, 322.
³ Ricour, C, and Nihoul-Fekete, C, *Archives Françaises de Pédiatrie*, 1970, **30**, 469.
⁴ James, B E, and MacMahon, R A, *Medical Journal of Australia*, 1970, **2**, 1161.

Cracking urinary bladder stones

SIR,—Your interesting leading article (9 July, p 79) suggests that electronic stone disintegration is a safe method of dealing with vesical calculi, though not without significant disadvantages. In my view the method is also accompanied by distinct hazards.

Each underwater spark produces not only the shockwave which you mention but also a bubble of vapour, which expands and contracts extremely rapidly in oscillatory fashion in the subsequent five or so milliseconds.¹ The maximum size of this bubble depends among other things on the electrical energy used, but in one instrument² (not the one you mention) an energy of 18 joules produces a bubble approximately 3 cm in diameter. Each time the oscillating bubble reaches a minimum volume it emits a pressure pulse and the first one or two pulses are comparable in destructive force to the preceding shockwave. The process has many similarities, except in scale, to the underwater detonation of high explosive.

Although the oscillating bubble, through its pressure pulses, adds significantly to stone destruction it is not widely appreciated that it also represents the major source of hazard from the technique, not from the pressure pulses (which, like the shock wave, pass relatively harmlessly through the bladder wall) but from the associated violent mass movement of water. Whereas a large stone shields the bladder wall from the vapour bubble and the fluid it rapidly displaces, a smaller fragment may be ejected into or even through the bladder wall if inappropriate power settings and techniques are used. These risks are not merely theoretical as damage to the bladder wall and frank perforation have been reported.³⁻⁵

The phenomena described make it clear why attempts to use existing disintegrators in the confined space of the ureter have resulted in damage⁴ and why their recent suggested use in the renal pelvis is inappropriate.

It may nevertheless prove possible to meet

the need, to which you direct attention, for instruments to tackle ureteric stones. Modifications to electrode design can produce focusing, enabling power (and hazards from the bubble) to be reduced without loss of effectiveness. It may also prove possible to produce a totally enclosed fluid-filled electrode, thus confining the bubble but permitting passage of the shock wave, but the engineering problems are considerable. Finally, further developments of the device described by Schuy and Schmidt-Kloiber⁶ in which the mechanical energy of external underwater electrical discharges is conveyed to the target calculus by a reciprocating flexible rod may also provide a solution.

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- ¹ Tidd, M J, et al, *Biomedical Engineering*, 1976, **11**, 5.
² Wallace, D M, Cole, P F, and Davies, K L, *British Journal of Urology*, 1972, **44**, 262.
³ Tidd, M J, et al, *Urological Research*, 1976, **4**, 49.
⁴ Alfthan, O, and Murtomaa, M, *Scandinavian Journal of Urology and Nephrology*, 1972, **6**, 23.
⁵ Hospital Equipment Information, 1972, **41**, 3.
⁶ Schuy, S, and Schmidt-Kloiber, H, *Biomedizinische Technik*, 1973, **18**, 17.

Tuberculous peritonitis with cirrhosis of the liver

SIR,—In your excellent leading article on abdominal tuberculosis in Britain (18 June, p 1557) it is suggested, among other things, that "ascitic fluid with lymphocytosis and high protein concentration should . . . increase the suspicion of tuberculosis." However, in tuberculous peritonitis complicating cirrhosis of the liver the protein concentration of the ascitic fluid may be low.¹ Tuberculous peritonitis in cirrhotics "is still encountered and is often unsuspected."² We should like to draw attention to such a diagnostic possibility, reporting a case of tuberculous peritonitis complicating cirrhosis in which the protein concentration in the ascitic fluid was low.

A 34-year-old woman was admitted to our department because of ascites under pressure, anorexia, abdominal and right hypochondrial pain, severe weakness, and pyrexia up to 38°C. The history had started two years previously with progressively deteriorating flatulent dyspepsia and weakness. Four months before admission pyrexia, abdominal pain, and ascites were added. On examination we found stigmata of liver disease, mild jaundice, ascites under pressure, and oedema of the ankles and legs. After we had aspirated about 1.5 l of ascitic fluid a large hard spleen with a sharp edge (about 10 cm below the left costal margin) and many small intra-abdominal lumps were felt. There was no hepatomegaly and no lymph-node enlargement. The blood count and film were normal and the erythrocyte sedimentation rate was 90 mm in the first hour. The serum albumin concentration was 30 g/l and that of globulins 57 g/l. There was mild elevation of the serum alkaline phosphatase and aspartate and alanine transaminase (SGOT and SGPT) activities. The plasma bilirubin ranged from 32.5 to 107.7 µmol/l (1.9 to 6.3 mg/100 ml) and was mainly conjugated. Tests for hepatitis B antigen were positive, for α-fetoprotein negative, and smooth-muscle antigen positive. The ascitic fluid was examined twice. The protein content was about 10 g/l and the Rivalta reaction negative; there were many leucocytes mainly lymphocytes. Tubercle bacilli were present in both the specimens. The chest x-ray was normal and a tuberculin skin test (1:100 000) was negative. A liver scan was compatible with cirrhosis.

The patient was treated with a conventional triple antituberculosis treatment. After some days the pyrexia declined and finally disappeared and progressively the appetite improved, the abdominal pain subsided, and the intra-abdominal

lumps almost disappeared. The patient was discharged from hospital but unfortunately died about three months later in hepatic coma.

Although the ascitic fluid in tuberculous peritonitis usually contains more than 25 g of protein/l and in cirrhosis less than 25 g/l, if the two diseases coexist values greater or less than 30 g/l have been reported.¹ The presence of pyrexia and abdominal pain in a cirrhotic raises the possibility of another disease. Hence the diagnosis of tuberculous peritonitis must be kept in mind when a cirrhotic patient presents with pyrexia and abdominal pain even if the ascitic fluid is a transudate. Thorough examination of the ascitic fluid for tubercle bacilli, including culture and inoculation, is mandatory.

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- ¹ Burack, W R, and Hollister, R M, *American Journal of Medicine*, 1960, **28**, 510.
² Sherlock, S, *Diseases of the Liver and Biliary System*, 5th edn. Oxford, Blackwell Scientific, 1975.

Vitamin B₁₂ for vegans

SIR,—We read your expert's reply (11 June, p 1525) and Mr Alan Long's letter (16 July, p 192) on vegan sources of vitamin B₁₂ with interest.

Beliefs that the comfrey plant (*Symphytum officinale*) is a natural source of vitamin B₁₂ persist and are repeated in the current catalogue of at least one firm of horticultural seedsmen and another specialist supplier of herbal products. We therefore extracted 12.5 g of freshly picked comfrey leaves by boiling in 500 ml acetate buffer (pH 5.0) containing 0.01% sodium cyanide in preparation for assay.¹ No vitamin B₁₂ was detected in the extract using the *Euglena gracilis* var *bacillaris* z-strain assay²; this implies a vitamin B₁₂ concentration of less than 10 ng/l of extract. Thus 1 kg (2.2 lb) of fresh comfrey leaves could at most have contained 400 ng (0.4 µg) of vitamin B₁₂.

We therefore conclude that comfrey leaves are not relevant as a source of vitamin B₁₂ in mixed, vegetarian, or vegan diets.

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- ¹ Gray, L F, and Daniel, L J, *Journal of Nutrition*, 1959, **67**, 623.
² Hutner, S H, Bach, M K, and Ross, G I M, *Journal of Protozoology*, 1956, **3**, 101.

Schistosomal myelopathy

SIR,—The report of a case of schistosomal myelopathy by Dr J Cohen and others (14 May, p 1258) is of great interest, but their conclusion that the cord damage is immunological is open to doubt. The presence of specific antibodies, whether in the serum or the CSF, indicates only that there is an immune reaction and not that pathological changes are due to it. In fact a study of previously reported cases of this condition would indicate that direct involvement of the cord