pared with 61% of vagotomy and drainage patients. In the gastrectomy group only 30% gained weight compared with 54% of the other group.

In the vagotomy and drainage group the results were similar after either truncal or selective vagotomy and after either pyloroplasty or gastrojejunostomy. True dumping as distinct from small-stomach syndrome is rare in patients on a rice diet, and was seen less often in the vagotomy and pyloroplasty patients than after vagotomy and gastrojejunostomy or gastrectomy.—I am, etc.,

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¹ Tovey, F. I., *British Journal of Surgery*, 1969, 56, 281.

Fatal Hepatic Necrosis and Halothane

SIR,—As it is still debated¹ whether halothane is hepatotoxic or not, we would like briefly to report two cases.

A woman, 55 years old, had been operated on five years before for varicose veins under thiopentone-halothane-N₂O-O₂ anaesthesia with pethidine and atropine as premedication. On the present occasion biopsy was performed for a breast tumour under the same anaesthetic. As cancer was found, radical mastectomy was performed nine days later under thiopentone-suxamethonium-pethidine-halothane-N₂O-O₂ anaesthesia with pethidine and atropine as premedication. Fever was not noticed between the operations, but her temperature was taken on the day before the second operation only, and was then 37.4°C. She had fever, 38.9°C, on the first three days after the second operation and jaundice was noticed on the fourth, when the temperature had begun to fall. She developed liver insufficiency and died 28 days after the second operation. Necropsy revealed massive centrilobular liver necrosis (liver weight 950 g), acute pancreatic necrosis, cholaemic nephrosis, and haemorrhagic diathesis. No metastases were found.

The second patient, a woman 54 years old, was operated on for varicose veins of both legs with stripping and ligature in two stages with four days' interval between them, both operations being performed under thiopentone-halothane-N₂O-O₂ anaesthesia with pethidine and atropine as premedication. Between the operations she was febrile (maximum 37.7°C). On the fifth day after the second operation her temperature was 40.7°C, and jaundice was noticed on the ninth day. She developed liver insufficiency and died on the 17th day after the second operation. Necropsy showed massive centrilobular liver necrosis with congestion (liver weight 1,570 g), acute pancreatic necrosis, cholaemic nephrosis, pulmonary oedema, and haemorrhagic diathesis with multiple erosions of the stomach.

No contacts with jaundiced persons were known. The first patient was given 450 ml blood during her mastectomy. Of pertinent drugs, the first patient had been taking meprobamate, paracetamol, and cyclopenthiiazide fairly recently. The second patient had had hydrochlorothiazide and a multivitamin preparation with caffeine.

Cholestatic jaundice has been reported following meprobamate treatment.^{2,3} Overdosage of paracetamol has occasionally resulted in fatal liver necrosis,⁴ and this can also be produced in rats with large doses.⁵

Liver damage following cyclopenthiiazide does not seem to be described. The related substance chlorothiazide is well known to be able to precipitate liver coma in patients with cirrhosis. It has been reported occasionally to produce severe hepatic injury, with necrosis⁶ and cholestatic jaundice.^{6,7}

Neither of the patients had eosinophilia. The only morphological material available was from the necropsies. Electron microscopy of the livers showed extensive autolysis, and there were no possibilities to distinguish possible pathognomonic changes in the mitochondria.⁸ Examination for Au-antigen was not possible at that time (1966), and no serum is preserved.

The Swedish Adverse Drug Committee considered the relationship between the repeated halothane anaesthetics and the fatal hepatic necroses to be established (*säkerställd*) in these two cases.⁹ We are inclined to agree. The finding of acute pancreatic necrosis in cases of fatal hepatic necrosis ascribed to halothane has been reported previously.¹⁰—I am, etc.,

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- ¹ Simpson, B. R., Strunin, L., and Walton, B., *British Medical Journal*, 1971, 4, 96.
- ² Klatskin, G., in *Diseases of the Liver*, ed., L. Schiff, 2nd edn., p. 453, Philadelphia, 1963.
- ³ Smetana, H., *Annals of the New York Academy of Sciences*, 1963, 104, 821.
- ⁴ Maclean, D., Peters, T. J., Brown, R. A. G., McCarthy, M., Baines, G. F., and Robertson, P. G. C., *Lancet*, 1968, 2, 849.
- ⁵ Boyd, E. M., and Berczyk, G. M., *British Journal of Pharmacology*, 1966, 26, 606.
- ⁶ Husebye, K., *American Journal of Digestive Diseases*, 1964, 9, 439.
- ⁷ Drerup, A. L., Alexander, W. A., Lumb, G., Cummins, A. J., and Clark, G. M., *New England Journal of Medicine*, 1958, 259, 534.
- ⁸ Klion, F., Schaffner, F., and Popper, H., *Annals of Internal Medicine*, 1969, 71, 467.
- ⁹ Uvnäs, B., and Westerholm, B., *Läkartidningen*, 1966, 63, 3801.
- ¹⁰ Virtue, R. W., and Payne, K. W., *Anesthesiology*, 1958, 19, 562.

Banana and L-Dopa

SIR,—Upper alimentary side effects of L-dopa therapy are common. Dr. D. Riddoch (1 January, p. 53) described a patient with gastritis, probably due to this drug. Others have noticed anorexia,¹ nausea, vomiting, complications in coexistent peptic ulcers,² and an increased consumption of sweets with a subsequent rise in the dental caries rate.³ The vomiting of liquorice-coloured material has also been reported,⁴ and one such patient was recently encountered who produced this symptom whenever he swallowed a banana in addition to his levodopa tablet.

This phenomenon prompted the following experiments. Powdered levodopa was mixed with banana, banana plus tap water, banana plus saliva, and banana plus vomitus at room temperature. In all cases the following colour changes resulted—a faint pink, followed by a bright brown, then a dark brown, then a grey, and, finally, a liquorice-like black. The colour changes started very rapidly but the speed of the complete series of changes seemed to depend on the surface used for the experiment—being over within minutes on a scalpel blade, slower on a wooden spatula, but taking several hours in a plastic container. Such colour changes did not occur in the absence of levodopa.

Serotonin is present in banana and human brain tissue⁵ but no significant colour changes resulted when levodopa was mixed with serotonin creatinine sulphate. The

above colour changes also occurred when powdered L-dopa was mixed with pieces of grape and plum. It seems possible that certain enzyme systems present in some fruits cause chemical degradation changes in levodopa, and it may be that the metal in the scalpel blade catalyzed such a reaction.—I am, etc.,

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- ¹ Treციokas, L. J., Ansell, R. D., and Markham, C. H., *California and Western Medicine*, 1971, 114, 7.
- ² Martin, W. E., *Journal of the American Medical Association*, 1971, 216, 1979.
- ³ Paulson, G. W., *Ohio State Medical Journal*, 1971, 67, 512.
- ⁴ Garfinkel, H. A., and Goldberg, I. J. L., *Lancet*, 1971, 1, 1079.
- ⁵ Goodman, L. S., and Gilman, A., *The Pharmacological Basis of Therapeutics*, 3rd edn., p. 644. London, Macmillan, 1965.

Fibrin Degradation Products in Hypoxic Full-term Neonates

SIR,—In their article entitled "Coagulation Defects in Hypoxic Full-term Newborn Infants" Dr. M. A. Chadd and other (27 November 1971, p. 516) reported, among other things, a significant correlation between a low Apgar score (≤ 5) and raised levels of fibrin degradation products (F.D.P.). During the last few years we have been especially interested in fibrinolysis in newborns.¹ We have assayed F.D.P. with Niléhn's immunochemical method² in serum from blood collected in tubes containing aminocaproic acid. This method demonstrates F.D.P. down to a concentration of 5 µg/ml, and comprehensive investigations in adults at this laboratory² have shown that F.D.P. are never demonstrable in health and that, when present, they always denote disease. In our studies only levels of >10 µg/ml were accepted as being of pathological significance ("F.D.P.-positive").

We have examined 154 infants with gestational ages of 25 to 42 weeks. They were studied for F.D.P. during the first 48 hours of life. Sixty-four of the infants who had Apgar scores³ of 7-10 at 10 minutes and remained healthy afterwards were assigned to one group (H-group) while the remaining 90 with Apgar scores of less than 7 at 10 minutes and with later firm symptoms of idiopathic respiratory distress syndrome or other, mainly respiratory, symptoms were assigned to another group (S-group).

Forty of the infants were F.D.P.-positive, (11-300 µg/ml)—36 in the S-group, but only four in the H-group. The higher incidence of F.D.P.-positive cases in the S-group was studied from various angles. The occurrence of F.D.P. in the infants did not appear to vary with the presence or absence of complications of pregnancy or delivery. F.D.P. were more common in the infants with idiopathic respiratory distress syndrome than in those with other respiratory symptoms. The Table relates F.D.P. to the Apgar scores at 1 and 10 minutes using generally accepted limits³ for the various score groups. F.D.P. were significantly more common in infants with a score of 0-3 at 1 minute than in those with a higher score at that time. At 10 minutes the frequency of F.D.P.-positive cases decreased with increasing Apgar score. Determination of the arterial pH and of the blood gases (umbilical catheter) did not reveal any significant correlation between hypoxia/acidosis and F.D.P.

Apgar score 10 min.	F.D.P. positive/negative			
	0-3	4-6	7-10	Total
1 min.				
0-3	8/0	9/2	1/2	18/4
4-6	0/0	1/4	6/17	7/21
7-10	0/1	1/3	10/25	11/29
Total	8/1	11/9	17/44	36/54

We agree with Dr. Chadd and colleagues when they say that there is a positive correlation between a low Apgar score and raised levels of F.D.P. However, Dr. Apgar has pointed out³ that the score at 1 minute does not reflect oxygenation itself. Furthermore, "biochemical confirmation of hypoxia" obtained by capillary blood gas determinations is inappropriate and must be performed on arterial blood, as has been clearly shown by, among others, Koch and Wendel.⁵

In our opinion, therefore, a one-minute

score and capillary oxygen tension assays do not warrant Dr. Chadd's suggestion of a causal relationship between hypoxia and raised levels of F.D.P. It appears that all we can say today is that a low Apgar score reflects the existence of some underlying pathologic state not necessarily requiring the presence of hypoxia.—We are, etc.,

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- 1 Eklund, H., and Finnström, O., *Acta Paediatrica Scandinavica*, 1970, 59, Suppl., 206, p. 31.
- 2 Hedner, U., and Nilsson, I. M., *Acta Medica Scandinavica*, 1971, 189, 471.
- 3 Apgar, V., *Pediatric Clinics of North America*, 1966, 13, 645.
- 4 Hutchison, J. H., Kerr, M. M., Douglas, T. A., Inall, J. A., and Crosbie, J. C., *Pediatrics*, 1964, 33, 956.
- 5 Koch, G., and Wendel, H., *Acta Paediatrica Scandinavica*, 1967, 56, 10.

Doctors and Overpopulation

SIR,—The generous correspondence (22 January, p. 242) following our letter (8 January, p. 108) has raised many points of great interest. Perhaps I could comment on one of these by Dr. Thomas Lodge. I think it is a most important one—namely, that what we are "suggesting is nothing less than the use of organized medicine as an instrument of Government political policy at the expense of individual freedom." Were such a suggestion indeed made I am sure all of us would settle for our duty to our individual patients. But of course we have suggested no such thing.

In practice what is happening today is that up and down the country women in trouble are going to their doctors asking for help in the termination of pregnancies that they do not wish to have. Depending on which part of the country they live in, they will either get the termination under the Health Service or not. What some of us are saying is that these patients should be treated with comparable understanding, whatever their home town. What we are also saying is that family planning should be energetically pursued. That responsible and senior doctors in hospital and practice should concern themselves and see that patients get the contraceptive advice that they want. Among the other things we are saying is that a sensible working man who wants to plan his family and decides to have a vasectomy should not be asked to pay up to £40, but should have it done under the National Health Service. I fail to see how any of these measures are in any way at the "expense of individual freedom." Duty to our patients and planning to protect our children from the horrors of overpopulation happily go hand in hand.

Some of your readers may remember that at the end of our letter we asked for support from doctors and medical students. It might be of interest that we have received over 500 letters of support and two criticizing our efforts.—I am, etc.,

GEORGE MORRIS

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proportion of conceptions remain unplanned and unwanted. While we have no hesitation in giving family planning advice and assistance to any of our patients who seem "at risk," even so, in our own practice, we still have to deal with a number of unwanted pregnancies. Apart from our N.H.S. practice (which includes affiliation to the local general practitioner unit so that we deal with all aspects of pregnancy in our patients), we also work in a private nursing home where during the last two years we have collected extensive experience in performing abortions and male and female sterilization.

At the present time we are going through the case records of the very large number of pregnancies terminated by us. These show that, in experienced hands, the complications following vaginal abortion during the first and second trimester of pregnancy (normally up to 22 weeks from the date of the last menstrual period) by various methods are even fewer than those reported recently in articles published on the subject by N.H.S. gynaecologists. This morbidity rate is particularly low for cases up to 14 weeks.

With regard to female sterilization, we now perform this operation through a very small incision using a McEvedy proctoscope to deliver the Fallopian tubes; in our opinion this technique is superior to the laparoscopic method and requires usually only a short stay for the patient.

As a result of our work, we have come into contact with a large number of general practitioner colleagues up and down the country and are often saddened by the attitude of many of them not only towards family planning and abortion but also sterilization. We respect the moral and religious views of those who consider that the prescribing of oral contraception to single women is unthinkable, or who feel that abortion, except on the most stringent medical grounds, is evil. However, we deplore attempts made by some of them to impose their own moral scruples on their patients and their efforts to withhold referral to doctors of a different persuasion.

We ourselves find no difficulty on the one hand in providing antenatal care for those of our patients who wish to continue

with their pregnancies, while on the other hand offering assistance in the fields of contraception, abortion, and sterilization to others who seek this from us and for whom we consider such help desirable.

We congratulate the signatories to the letter (8 January, p. 108) in their attempt to form a body of medical opinion in Britain which takes cognisance of the population problem as a whole. For our part, we are happy to extend our co-operation in this project in any way which may be helpful to their cause. We would welcome a visit from any colleague who would like to discuss with us the various aspects of population control, and would be happy to demonstrate our technique for termination of pregnancies and male and female sterilization.—We are, etc.,

PETER GITTINS
F. K. MINWALLA

Birmingham

SIR,—With regard to the letter "Doctors and Overpopulation" (8 January, p. 108), we cannot accept the suggestion that one way of restricting the population should be by increasing the number of abortions performed. Family planning and in some cases sterilization are reasonable methods of control, but abortion is in our opinion and still in that of many others in quite a different category.

For the Abortion Act to operate evenly over all the country either all doctors would have to feel the same way about it, as we do not and never will, or many would have to subordinate their judgement and ethical views to a majority viewpoint—and would this not be the end of personal and professional freedom? We would think that education and suggestion, financial help with family planning if needed, and practical help or transport for mother and children to get to their doctors or clinics are the main requirements.—We are, etc.,

A. JACQUELIN HILL
F. R. GAMMAN

Dursley, Glos

** Appendix II of the B.M.A. Council's Annual Report, "Inquiry into the Working of the Abortion Act," appears at p. 33 of the Supplement. Ed., B.M.J.

Central Nervous Disturbance with Pentazocine

SIR,—Recently I had as a patient a 45-year-old well-educated woman who was admitted to hospital in severe pain due to cervical spondylosis. She had no history of personality disorders. On admission she was treated with analgesics, muscle relaxants, cervical traction, and a cervical collar. Initially she required pethidine, but this was changed to pentazocine after a few days. As the response was slow, she had pentazocine over a period of two and one-half weeks.

One evening I was called to see the patient urgently because she was hallucinated, very anxious, and apprehensive. She complained of tingling all over her body. Her pulse rate was extremely rapid, and the blood pressure raised. She told me that on closing her eyes she was seeing a complex pattern of psychedelic colours. She had had her last injection of pentazocine an hour previously. Then and only then did she tell me that for the previous few days she had felt strange soon after receiving the pentazocine injections, but she did not think it was worth mentioning this to the nursing staff. Later she described her incident very clearly and

SIR,—We are partners in general practice in Birmingham, and it is distressingly clear to us that even in this day and age a high