the high association between trichomoniasis and gonorrhoea should be borne in mind in the management and treatment of these infections when the presence of either cannot be discounted totally, and when symptoms persist or reinfection occurs in the partner concerned.

I am grateful to Dr. J. L. Fluker for his advice, and for making this report of cases under his care possible.

—I am, etc.,

W. TSAO.

West London Hospital,
Charing Cross Hospital Group,
London W.6.

Farmer's Lung

SIR,—This condition is now well recognized in many areas as a cause of disabling industrial disease in agricultural workers, but it may be less well known that it can affect other members of the farming community. In the last two months we have seen three farmers' wives with this condition. They were all about 30 years of age, and two did nothing more than feed a few calves, but one did help her husband in farm duties, and was regarded by her husband as a "good worker."

In view of the long-term effects of this condition, early recognition by the family doctor is of supreme importance. An acute or subacute respiratory illness with dyspnoea of a non-wheezy type, particularly if accompanied by cyanosis and exceptional tachycardia, should arouse suspicion and blood should be sent for *Micropolyspora faeni* (*T. polyspora*) precipitins. Chest examination may show some areas of fine rales, and the x-ray a fine "groundglass" mottling in some or all of the lung fields, but these findings may be relatively transient. Ventilatory tests show a marked reduction in the forced vital capacity, but there is usually a smaller drop in F.E.V.₁.

Steroid therapy usually leads to dramatic clinical improvement, and we believe it should be initiated as soon as the diagnosis is made. Ideally dosage and duration of treatment should be decided in conjunction with the respiratory laboratory, but if this is not available 15 mg. of prednisone daily should be given for two weeks, and then a slow reduction controlled by clinical findings for a further six weeks at least. It is essential that contact with the suspected hay dust should be broken absolutely, and the value of an agricultural mask in preventing further attacks is very doubtful.—We are, etc.,

G. E. ADKINS.

J. T. SMYTH.

Ivybank Chest Clinic,
Exeter, Devon.

Vitamin B₁₂, Serum Folate, and Hypochromic Anaemia

SIR,—The presence of hypersegmented neutrophils in the blood films of many patients with hypochromic anaemia prompted us to ascertain the serum folate and vitamin B₁₂ concentration in patients referred to this laboratory by general practitioners. Altogether 161 patients (128 women and 35 men) presented with hypochromic anaemia. The serum folate¹ was determined in every case, and the serum vitamin B₁₂ concentration (z strain of *Euglena gracilis*) in

156 cases. For comparison with this group, serum vitamin levels were determined also in 101 patients who were not anaemic and had also been referred by their general practitioners. These controls were matched as far as possible according to age and sex with cases in the first group.

TABLE I.—Serum Folate Levels. (Normal Range 3.5 to 12 ng./ml.)

	Hypochromic Anaemia	Normal Controls
Number of cases . . .	161	101
Range of serum folate (ng./ml.) . . .	0.8 to 12.7	2.5 to 11.9
Mean folate (ng./ml.) . . .	4.9	5.9
Standard deviation (ng./ml.) . . .	2.0	1.9
Standard error of the difference (ng./ml.) . . .	0.27	
No. of cases with low folate:		
0.8 to 1.4 ng./ml. . .	3	0
1.4 to 2.4 ng./ml. . .	15	0
2.5 to 3.4 ng./ml. . .	22	6

As shown in Table I, subnormal levels were found in 25% of patients with hypochromic anaemia and in 6% of controls ($P<0.01$). The mean folate of 4.9 ng./ml. in the hypochromic anaemias was significantly lower than that of 5.9 ng./ml. in the controls.

TABLE II.—Serum Vitamin B₁₂ Concentrations. (Normal 150 to 800 pg./ml.)

	Hypochromic Anaemia	Normal Controls
No. of cases . . .	156	100
Range of serum vitamin B ₁₂ (pg./ml.) . . .	20 to 728	161 to 840
Mean vitamin B ₁₂ (pg./ml.) . . .	327	381
Standard deviation (pg./ml.) . . .	162	127
Standard error of the difference (pg./ml.) . . .	19.3	
No. of cases with low vitamin B ₁₂ :		
20 to 99 pg./ml. . .	10	0
100 to 149 pg./ml. . .	11	0

Likewise there was a significant difference between the mean serum vitamin B₁₂ concentration of the anaemic patients, which was 327 pg./ml., and that of the controls at 381 pg./ml. (Table II). All the controls had a normal serum vitamin B₁₂, while 10 patients with hypochromic anaemia (6.4%) presented with a level of less than 100 pg./ml., and in a further 11 it ranged from 100 to 149 pg./ml. ($P<0.01$).

Hypersegmentation of neutrophils was observed in the blood films of 35 patients with hypochromic anaemia, but only 25 of these had subnormal serum folate or B₁₂ levels; conversely, no hypersegmented neutrophils could be found in the blood of 36 anaemic patients with abnormally low serum B₁₂ or folate levels, nor in any of the control cases.

This preliminary study has thus confirmed that the signs of hypochromic anaemia frequently mask an underlying vitamin B₁₂ or folate deficiency. It has also shown that, while the presence of hypersegmented neutrophils in stained blood films is a useful pointer in such cases, it is by no means a reliable substitute for serum vitamin assays.—We are, etc.,

P. H. JOHNSON.

I. FORREST-HAY.

C. GILES.

Pathology Department,
City General Hospital,
Stoke on Trent, Staffs.

REFERENCES

- Waters, A. H., and Mollin, D. L., *J. clin. Path.*, 1961, **14**, 335.
- Hutner, S. H., Bach, M. K., and Ross, G. I. M., *J. Protozool.*, 1956, **3**, 101.

Transfusion and Perforation

SIR,—In reference to the recent articles concerning colonic perforation and exchange transfusion (9 November, pp. 345 and 349) one could dispute the argument that the umbilical venous catheter is a source of the problem of itself. Where the catheter ends up during exchanges is a moot point, as we do not normally perform radiological studies of this. The catheter may be in radicals of the portal system, ductus venosus, hepatic veins, inferior vena cava, or even in any of the cardiac chambers. One certainly notes pressure changes in the system when a child cries during exchange transfusion, and one would doubt if the slow injection of blood during an exchange in itself can lead to unphysiological pressure changes in the system.

The point which intrigues me in relation to the technique of exchange is the type of blood used. In Sheffield citrated blood is supplied for exchange transfusion, and I note that in the paper by Drs. R. Orme and Sheila M. Eades in two instances they used calcium supplements during the exchange, which suggests the use of citrated blood. We have known for a long time the metabolic problems of citrated blood—the initial low pH and the undesirable effects that this may produce during an exchange transfusion. It seems to me a reasonable proposition, worthy of pursuit, that the type of blood used during the exchange may have had some bearing on any vascular lesions which may have led to perforation of the gut.

I would be interested to know the type of blood used in the cases recorded by the Sheffield and Devon workers.—I am, etc.,

DAVID FORMBY.

Princess Margaret Hospital
for Children,
Perth, Western Australia.

Preperitoneal Prosthetic Herniorrhaphy

SIR,—I am grateful to Mr. N. O. K. Gibbon (18 January, p. 187) and Mr. J. M. Buchanan (25 January, p. 256) for replying to my letter briefly describing preperitoneal prosthetic herniorrhaphy (28 December, p. 832) and for their comments.

However, I hope that Mr. Gibbon does not imply that there is no room for further thought and innovation on the common problem of treatment of groin hernia. Excellent though Mr. Gibbon's treatment results are, other accounts of operation follow-up quote recurrent rates of 5–10% for indirect and up to 25% for direct inguinal herniae,¹ and it is these figures which I consider justification for rethinking the surgical treatment of groin hernia. Mr. Gibbon's reference to extended operations is surely not applicable to preperitoneal prosthetic herniorrhaphy, as this is simple in concept and easy in execution. Although I do not advocate its general adoption at this stage I can assure him that no hazards or untoward complications have been encountered in its application. It takes no longer to perform than a standard operation and for bilateral cases is materially less time-consuming. The technique is applicable without variation to inguinal hernia both indirect and direct, femoral hernia, recurrent hernia, and hernia *en glissade*; it is particularly advantageous for the recurrent case,