revealed antibody and therefore a state of immunity. The seronegative cases have remained seronegative after Ig prophylaxis and have delivered normal children with no increased levels of IgM in the cord sample. On the other hand if seroconversion had occurred following the administration of Ig the patient and her medical practitioner could be advised accordingly, but this has not occurred in our experience. It would probably be preferable, as suggested by Drs. Forrest and Menser, to have an Ig preparation with a high antibody titre, but as this is not generally available and because there is some variation in the antibody titre of the normal pooled Ig product, we have used a large dose of 3 g administered in two separate doses. Though this is considerably greater than what is advocated we think it is justifiable in the circumstances.—I am, etc.,

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1 Forrest, J. M., Honeyman, M. C., and Murphy, A. M., *Medical Journal of Australia*, 1973, **1**, 745.
2 Public Health Laboratory Service Working Party on Rubella, *British Medical Journal*, 1970, **2**, 497.

Puerperal Rubella Vaccination and Anti-D Immunoglobulin

SIR,—Drs. Jill M. S. Forrest and Margaret A. Menser report (25 May, p. 439) two patients in whom the use of immunoglobulin (Ig) prophylaxis caused delay in the serological response following exposure to rubella during pregnancy. Both infants were born with congenital rubella defects.

It may not be generally realized that the serological response obtained from vaccination against rubella in the puerperium may be altered by the concurrent administration of anti-D Ig to rhesus-negative women. We routinely take blood at the first antenatal visit for serological assessment of the patient's rubella immune status. In patients found to be susceptible vaccination against this disease is advised before discharge from hospital following delivery. An efficient form of birth control is recommended for three months following vaccination.

The manufacturers of Almevax and Cendevax recommend that vaccination with their products should not be carried out within six weeks following the administration of human immune serum globulin. The reason for this contraindication is that the Ig could contain anti-rubella antibodies, which if present would reduce or negate any effect of giving the vaccine. Normal Ig usually contains between 160 and 320 units/ml of rubella antibody, and anti-D Ig probably also contains rubella antibody within this range. The manufacturers of anti-D Ig state that it would be extremely difficult, if not impossible, to make a preparation free of rubella antibody. It would therefore be pointless to vaccinate against rubella and to administer anti-D Ig simultaneously.

It is essential to administer anti-D Ig to at-risk patients as soon after delivery as possible. On the rare occasions that these patients are also susceptible to rubella we recommend that the patient be informed of her susceptibility but not vaccinated against this in the puerperium. The patient's general practitioner is also informed of her susceptibility in order that he may arrange vaccination for her at a later date. This should not be within six weeks of the administration of anti-D Ig.—We are, etc.,

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Kidneys from Living Donors

SIR,—In your leading article (18 May, p. 344), which refers to the use of live donors for kidney transplantation, emphasis is placed on the predominent use of cadaveric donors in Australia and in the United Kingdom and other European countries. While there is no doubt about the accuracy of this observation, it is not strictly true to say that in the United Kingdom kidneys from living donors are used only occasionally except in Newcastle. Kidneys from 48 live related donors have been used at Hammersmith, and at a conference in January 1973, which was attended by representatives of most major British and European dialysis centres, I quoted an incidence of 24% for live donor operations in our current practice. Many feel that cadaver kidneys are preferable, but unless there is a good supply and the organs are physiologically acceptable—and this implies national adoption of the concept of cerebral death—the results are not likely to be nearly as good as those achieved when living related donors are used.—I am, etc.,

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Ergotamine-induced Headaches

SIR,—We would applaud Dr. N. J. Legg (11 May, p. 331) for drawing attention to the incidence of intractable headaches in patients who are taking substantial amounts of ergotamine tartrate. Since the initial publication of the experience of this condition in the Princess Margaret Migraine Clinic (formerly the City Migraine Clinic)[1] we have kept a record of all cases. In a sample population of 1,000 patients referred for consultation between June 1973 and April 1974 we found that in 43 the presenting symptoms were considered to be due to excessive use of ergotamine.

Analysis of these cases shows that the condition is seen more often in women than men (F:M = 31:12) and more often in association with common migraine than classical. In 34 patients the initial diagnosis was common migraine, in four classical migraine, and the remaining five patients were considered to suffer from headaches not due to migraine. The duration of abuse was protracted. Of the 43 patients 23 had taken ergotamine regularly each week for more than a year, and of these 23 7 had taken it for more than five years. We have included in our 43 patients only those who have taken more than 10 mg of ergotamine tartrate each week. Twenty took 10-20 mg, 14 took 20-30 mg, and nine took 30-70 mg weekly. The patients had daily headaches relieved only by further ergotamine and accompanied by nausea and general malaise, and we would emphasize that there is always some difference between these headaches and the migrainous headaches for which the patient initially sought treatment. In addition, our experience does not support the contention that the symptoms disappear immediately nor that the headaches are worse while the patients are actually taking the ergotamine. Only five patients stated that they suffered no headache on discontinuing the ergotamine and, indeed, two patients refused to do so on account of the severity of the headache they experienced. Twenty-three patients complained of the worst headache that they had ever had when they stopped taking the ergotamine, the symptoms lasting for from one day to two weeks. However, once this period was over the frequency and severity of the headache was considerably reduced.

We would welcome any suggestions which might lead to effective research into this syndrome, especially as we have no shortage of suitable patients. The term ergotamine-induced headaches seems suitable for this condition, as the headaches improve when the ergotamine tartrate is stopped once the initial withdrawal period is over. This seems especially important as one manufacturer continues to recommend doses of ergotamine[2] up to 24 mg/week, which, if taken regularly, would appear to be a level at which few if any patients could avoid this syndrome.—We are, etc.,

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1 Rowsell, A. R., Neylan, C., and Wilkinson, M., *Headache*, 1973, **13**, 65.
2 Association of British Pharmaceutical Industries, *Data Sheet Compendium*, p. 758. London, A.B.P.I., 1974.

Antibiotics and Farmers

SIR,—It seems a little hard to blame the farming community for the ineffectiveness of antibiotics in diarrhoea due to *Escherichia coli*, shigella, salmonellae, and other Gram-negative bacilli (leading article, 4 May, p. 235). It has been clear to many clinicians and clinical bacteriologists for some time that antibacterial agents do not have a beneficial effect on the course of the great majority of such infections, and this is unrelated to antibiotic resistance of the infecting strains.

It is probably true, as you suggest, that selection of antibiotic-resistant strains is favoured by the use of antibiotics. In the individual, whether animal or human, this selection is more likely to occur if lower dosages are used because of failure to eliminate the whole of the bacterial population. I think, however, it is wrong to suggest that the lower doses themselves are the cause of resistance. My own impression is that antibiotic-resistant strains become prevalent only where conditions are suitable for spread from individual to individual, and this situation is seen in relatively closed communities such as hospital wards. More attention paid to the general epidemiological principles which prevent contagion would be more likely to be effective in reducing the spread of resistant organisms in such environments than severe restriction of the use of antibiotics.

In the general population there is little evidence of the failure of treatment with antibiotics in proved bacterial infections. It is also probable that there are natural means for the elimination of R-factors and plasmids in the general community which balance their formation. After all, it is likely that these resistance factors and other mechanisms leading to genetic change which we measure by antibiotic resistance have been around for a long time and will continue to be so.

The problems created by antibiotic resistance of bacteria are small when compared with the good that has been done by