(controls) and 1.2 (fractures)—very similar to those of our own series, 1.6 and 1.8 respectively. All these distributions are therefore significantly positively skewed ($P < 0.005$).

We are, however, reassured that the observed difference in mean 25-OHD concentration between the two groups is statistically significant when suitable steps are taken to allow for the non-normality of the data. The reason that we did not observe such a difference in our own study presumably reflects, as Dr Baker and his colleagues suggest, the choice of control group. Because we wished to allow for the influence of a recent operation on the variables measured, we chose a control group from patients admitted to the same wards for elective surgery. Our fracture and control populations received almost identical sunlight exposure, whereas in the Leeds study the control group had been exposed to nearly twice as much sun as the fracture patients.

Although we were unable to implicate vitamin D deficiency in the pathogenesis of this fracture in London, the results of our study are consistent with the idea that the reduction in 25-OHD concentration observed in the Leeds fracture patients is due to their reduced exposure to sunlight, rather than due to some intrinsic defect in vitamin D metabolism.

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*.*This correspondence is now closed.—Ed,
BMJ.

Whooping-cough vaccination

SIR,—Dr David Turner (31 March, p 892) has questioned the need for erythromycin prophylaxis in young infants exposed to whooping cough, firstly because it would be difficult to get parental co-operation in giving a pleasantly flavoured syrup for two weeks to prevent an unpleasant or even dangerous disease and, secondly, because we should rather "speak with one voice" in advocating whooping cough vaccination, which will protect the vulnerable infant by herd immunity.

I believe that it is important to answer the second point and also to try to define more closely the concept of herd immunity. In certain infectious diseases such as diphtheria or poliomyelitis, when three-quarters of the population are vaccinated the natural spread of infection becomes so disrupted that the disease tends to die out. This valuable bonus I accept is effective herd immunity. However, in other infectious diseases despite the vaccination of three-quarters of the population the infection continues to spread unchecked in the community, although the disease may be most evident in the unvaccinated quarter of the community. This pattern appears true of measles and whooping cough, and unfortunately in the latter the "unvaccinated quarter" always contains the entire infant age group, where the mortality is largely concentrated.

The table shows data from two peak whooping cough years, before and after the recent decline in vaccination rates. The increase in notifications in 1978 would appear to be related to the decline in vaccination, but the number of infant deaths from whooping cough remains fairly constant at about one death per 50 000 births in each of the years. I interpret these figures as tending to show that

Whooping cough before and after decline in vaccination

	1974	1978
No of notifications	16 372	65 892
Vaccination rate (%)	77	<40
No of children born	640 731	592 668
No of infant deaths from whooping cough	13	11

whooping cough vaccination confers individual protection but not herd immunity.

For this reason I still put forward the view that erythromycin prophylaxis is the best practical approach to the protection of the vulnerable infant when whooping cough affects a family.

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New packaging of insulins

SIR,—At this hospital we are very concerned about the recent change in policy towards the packaging of insulins by one manufacturing company—that is, Novo Industri A/S. For many years the convention of colour coding insulin packs according to type and strength, regardless of manufacturer, has been regarded as a fine example of intercompany co-operation and of great value to pharmacists and patients.

In the convention the colours, blue, green, and yellow are particularly important in denoting strength; if Novo is genuinely concerned that we are not reading the labels properly it would have been more convincing had it used plain white packs with bold black lettering on all six faces of the box, instead of juggling with the established colours.

Novo's pack changes appear to us to be totally unjustifiable. The other insulin manufacturers have told us that they intend to retain the colour code convention, and we hope that Novo will restore the old packs as soon as possible.

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*.*We sent a copy of this letter to Novo, whose reply is printed below.—Ed, *BMJ*.

SIR,—Thank you for allowing me through your columns to reply to the letter you have recently received regarding the new packaging of our MC insulins. I should like to explain briefly the background to the packaging changes, which were not undertaken without much thought, discussion, and planning.

For some time concern has been expressed about the use of various colour codes for identification of type and strength of insulins and, with the advent of the highly purified insulins, there were insufficient colours available to continue with the old colour coding system. Among our own preparations, for example, both Lentard MC and Monotard MC were marketed under the same colour code, which was obviously an unsatisfactory state of affairs. Consequently, in October 1978 the British Diabetic Association called a meeting, which was attended by members of the medical and scientific section and the insulin manu-

facturers to discuss future policy for the labelling of insulins. This meeting concluded that:

(1) Colour should no longer be used to indicate insulin strength on insulin packs or labels (though it may be retained for vial caps, if generally agreed).

(2) Strength should be indicated by figures of adequate size set boldly, prominently, and repeatedly on the pack and label.

(3) Insulin type should be indicated in words on pack and label. Individual manufacturers' designation should be followed by the approved pharmacopoeial name, which should indicate species of origin.

(4) The inclusion of colour on the pack or label becomes a matter for individual manufacturers' policy. It may be a guide to brand recognition, production, or distribution control but must no longer be regarded as a general indication of strength or type.

(5) The public and professions must be informed of these changes.

We have followed these conclusions and recommendations with the approval of the medical and scientific section, the DHSS, the Pharmaceutical Society, and other relevant groups, culminating in the introduction of the new packaging whereby our insulins are identified by bold black printing on a white background, clearly indicating the type and strength of insulin (the band of colour on the cartons and labels is for production purposes only and does not constitute a colour code). Finally, we are conducting a widespread, comprehensive educational programme to familiarise members of the medical and allied professions and patients with the new system.

I hope that this brief summary will emphasise that we have not embarked on this exercise casually or unethically. Our concern, as always, is for the safety and well-being of the patient and we believe that the new packaging of our insulins is entirely consistent with that aim.

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Is there a future for clinical cytology?

SIR,—In her article (14 April, p 1031) Dr Dulcie V Coleman has presented much-discussed and pertinent questions relating to the future of cytology in this country.

The British Society for Clinical Cytology (BSCC) has been active in the development of this specialty over the past 15 years, both in the promotion of new investigational and diagnostic techniques and in the improvement of training and qualifications of cytopathologists and cytotechnologists. Dr Coleman produces a rather slanted view of the practice of most cytology laboratories in Britain. The initial use of unqualified personnel in the early 1960s was necessary to deal with the rapid increase in the number of uterine cervical smears when the national screening programme was introduced, and such screeners persist in only a few laboratories in this country. As a society we do not advocate the continuance of such a practice, though we recognise that among such "screeners" there are some highly skilled and competent workers—for whom, incidentally, the certificate of competence examination has been created to maintain standards in cytology screening.

The protracted negotiations by the BSCC with the DHSS, the Royal College of Pathologists, and the Institute of Medical Laboratory Science from the late 1960s have resulted at

last in a proper consideration by the latter organisation of the need to introduce a "special" examination in cytology. Through the appropriate committees the society is currently negotiating a full career structure for scientific officers. It is hoped that there will be equal and major modules in cytology and histology at both the ordinary and higher levels of the new TEC and Scotec (Technician Education Council and its Scottish equivalent) syllabus and examinations, allowing a broad common basis before specialisation occurs. This is because the actual practice of histological techniques and cytodiagnosis are substantially dissimilar. In many routine laboratories the same MLSOs have carried out both procedures on the basis that the screener's fatigue is relieved by other activities. It is justifiable nowadays to utilise the increasing amount of skilled technical processing of cytological materials required in a modern cytology practice to provide that variation and relief from screening.

From the pathologist's point of view, however, the picture is different. There is a wealth of special cytological techniques, as Dr Coleman points out, that can be developed in research, academic, and large regional laboratories; but almost 80% of routine cytodiagnosis is so closely allied to the practice of histopathology that the two skills are shown to be augmentative and should be performed by the same pathologist. For that reason the BSCC advocates a joint training programme in histopathology and cytopathology, as is the practice in many other countries, though it is obvious that there will be a number of pathologists who will ultimately wish to specialise and practice predominantly in cytodiagnosis in certain academic, research, or large regional departments.

The time has surely come to incorporate cytopathology into a dynamic economic and versatile diagnostic service practised by all cellular pathologists.

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Cervical cytology reporting

SIR,—I was interested to read a general practitioner's critique of cervical cytology reporting by Dr R E G Sloan (19 May, p 1350), though I shall not be adopting his monitoring test. I agree that merely reporting "no malignant cells" in "all cases" gives the clinician no indication whether the smear contained endocervical cells or not and hence no information on the validity of the result.

In this laboratory it is the policy to state when endocervical cells are not present—though this comment has at times evoked an emotive response from the clinician, who has regarded it as a criticism of his clinical competence. We have not unfortunately kept a tally of the number of smears in which endocervical cells are not seen but my impression, for what it is worth, is that they are absent in

about 10-15% of our cervical smears. Perhaps the one technician requesting a "significantly higher number of repeats" was accurate in his assessment of smears without endocervical cells. Repeating a smear naturally increases public expenditure; but whether this is wasteful is, I think, debatable. Garrett (1964)¹ suggested that perhaps a third of "positive" cases may be missed on a single examination and Yule (1972),² performing a second test after three months on a randomly selected group of women who had negative cytology, found an error rate of 18.9%—that is, one-fifth of the precancerous lesions were missed at the first test.

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¹ Garrett, W J, *Obstetrics and Gynaecology of the British Commonwealth*, 1964, 71, 517.
² Yule, R, *Acta Cytologica*, 1972, 16, 389.

Oligoclonal immunoglobulins and multiple sclerosis

SIR,—We have read the letter from Dr B R Casey and Mr A J Mason (28 April, p 1149) with regard to our article on oligoclonal immunoglobulins and multiple sclerosis (6 January, p 16).

It would seem that the bands which are being visualised in the region are probably high-molecular-weight haptoglobin oligomers, which are sharp rather than being diffuse when they are oligoclonal bands produced by many different clones of lymphocytes. It is for this reason that we stressed the importance of distinguishing the two types of bands in the final sentence of the first paragraph under "Methods." It is clearly possible to have both oligoclonal diffuse IgG bands and the sharp haptoglobin oligomers of high molecular weight that will occur from the transudation of serum proteins into the CSF along with the locally synthesised immunoglobulins. The three haptoglobin types can be distinguished by their different mobilities in the gel. As we also mentioned in the "Methods" section, the diffuse bands of IgG are more prominent on the Coomassie gel than on the naphthalene black gel, whereas the sharp haptoglobin oligomers are possibly more prominent on the naphthalene black gel than on the Coomassie gel. Therefore the three parameters of (a) diffuse versus sharp bands, (b) relative mobility, and (c) Coomassie versus naphthol allow the ready distinction of immunoglobulins from a high-molecular-weight leak.

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Air embolism and intravenous catheters

SIR,—I read with interest the short paper entitled "Air embolism after accidental removal of intravenous catheter" (14 April, p 987). Central venous pressure lines are commonly introduced subcutaneously via the subclavian route. We train our resident staff to familiarise themselves with this technique, both electively for total parenteral nutrition and in resuscitation of patients in shock.

The period of greatest risk for air embolism occurs during the insertion of the catheter and can be reduced by placing the patient in the Trendelenburg position. At our institution we

experienced three near-mishaps from air embolism. Fortunately the outcome was good in all three patients. After introduction into a vein the catheter (length 20 cm) is usually threaded down a 14-gauge introducer needle and the needle drawn back. Our experience with air embolism has been in patients who had a disconnection accidentally occurring at the hub connection. This prompted the invention of a simple device to prevent such disruptions from occurring.¹ This device, constructed of stainless steel, can be reused. It can be modified in both length and diameter of the orifices to fit different connections. If desired, tapes can be used to make the connection even more secure.

In the case described, removal of the introducer would have prevented any possibility of air embolism occurring with accidental removal of the intravenous catheter.

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¹ Colquhoun, B P D, *Canadian Journal of Surgery*, 1977, 20, 565.

Bastard conceived in intensive care unit

SIR,—I have on many occasions corrected nurses and junior doctors who have reported that "the drip issued." Never did I expect this monstrosity to appear in the pages of the *BMJ*, but there it was (14 April, p 987): "... she had a peripheral venous drip, but this issued."

Did the Editor nod, or does this extend the trend mentioned in the comment on Mr Karl Sabbagh's letter (31 March, p 894), in which you refer to "... our correspondence columns, where we try to retain the individual flavour of the contributions"?

Rubbing salt into the wound is the fact that the report came from the intensive care unit of one of my own hospitals, and there cannot be many bastards conceived in intensive care units. I have always tried to persuade anaesthetists to take precautions before conjoining to put pen to paper, but clearly without success.

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Antiplasmin concentrations after surgery

SIR,—May we comment on the article by Dr D A Taberner and others (28 April, p 1122)? Recent studies in our laboratories^{1,2} have revealed that excellent correlations between functional activities and concentrations of antiproteases are obtained with plasma samples from healthy volunteers. Such correlations are not found, however, with plasma samples taken from patients whose plasma protease systems (for example, coagulation, fibrinolysis, kallikrein-kinin) have been activated.

By utilising chromogenic peptide substrate and immunochemical assays³⁻⁵ we have compared functional activities and concentrations of plasma antiproteases in samples from normal subjects, patients with septicaemia, and patients undergoing major heart surgery employing a haemodilution regimen.⁵ Our results show that it is not sufficient to measure