recommending them the authorities have given the opportunity to psychiatrists and nurses to refuse disturbed offenders with the excuse that their hospital does not provide security or that these patients will disturb others. Many of the patients now refused are not patients likely to be accepted by the secure units when they exist. They are individuals often in the category you describe who should be cared for in psychiatric hospitals now (as they always were in the past) and will still require accommodation in them in the future.

Psychiatric hospitals have a responsibility to provide a comprehensive psychiatric service short of maximum security accommodation and psychiatrists have never agreed a policy with the Department of Health and Social Security which would relieve them from that obligation. Despite this it is a selective policy that has slowly been adopted and apparently accepted (by default) by the Department without any alternative service being proposed by anyone. The DHSS says that in the end it cannot insist that a psychiatrist cares for a particular patient. The doctors say the Department fails to provide alternative care. So that in practice there is an impasse. The Department would also make the point that it has distributed some £5m or more annually in 1976 and 1977 to develop "interim facilities" before regional secure units are established, but figures recently published indicate that most hospital regions find that very little of this money is being taken up and spent as intended.

All this is a serious problem which is unique in not being primarily a financial one. It is to be hoped therefore that a more urgent effort will be made by all concerned to solve it. The prisons, after all, cannot refuse people sentenced by the courts as hospitals can. Perhaps the courts should be more selective in deciding who really requires custody. More remands on bail will help.

R S BLUGLASS

Midlands Centre for Forensic
Psychiatry,
All Saints Hospital,
Birmingham

The neonatal electrocardiogram and unexpected death in infancy

SIR,—The excellent studies reported by Dr D P Southall and others (3 September, p 597) and by Dr B R Keeton and others (p 600) of cardiac arrhythmias found on routine screening in infants and the conduction disorders in babies found in a collapsed state call for a short comment in view of their recommendations of clinical screening related to cot deaths.

Unexpected death in infancy is a clinical syndrome only. It has varying aetiologies and different causes of death. However, among these there is both indirect evidence, as from papers such as those cited above, and also direct evidence from necropsy studies of hearts that indicate that a group of these deaths have their chief cause within the heart. The suggestion of neonatal electrocardiogram screening for such lesions is an obvious one and when in 1973 we set up a prospective study in Sheffield with a view to identifying features in babies at increased risk of unexpected death we included a neonatal ECG in the study of all high-risk infants. In a cohort of 11 424 babies, we made a special study of 627 who were thought to be at increased risk of unexpected death. In the four babies of this cohort that subsequently died

no abnormalities were noted in the neonatal ECG. One of these deaths was probably of cardiac origin.

From a present logistic viewpoint, if we assume that one in 10 cot deaths has a cardiac cause, which is my present estimate, we would need to score at least 5000 general births to hit one case and if the figures published by Dr Southall and his colleagues are general we would, in this group, pick up perhaps 100 children with arrhythmias with, at present, no evidence that such ECG changes predispose to unexpected death.

The situation at the present time would appear to call for further, more detailed study and refinement in our tools of assessing the heart in infants rather than widespread screening.

JOHN L EMERY

Department of Histopathology,
Children's Hospital,
Sheffield

SI units and acidity

SIR,—One of the by-products of the introduction of SI (Système Internationale) units has been to cast doubt on what are the normal mean values for hydrogen ion concentration of the various biological fluids. For arterial blood the customarily accepted mean of normality has been pH 7.40 or 40 nanomoles of hydrogen ion per litre. This mean has been obtained in the past by averaging observed pH measurements from large numbers of samples.

If a series of pH values are taken which average 7.40 and then the average is taken of the SI equivalents the results must differ—an example is given in the accompanying table. This is because averaging logarithmic numbers is a root function (square root, cube root, N^{th} root, depending on how many values there are). In blood gas homeostasis the differences are of academic rather than clinical interest, as the range of pH values is so narrow. When considering other biological fluids such as gastric secretion or urine acidity significant errors can arise. In the example in the table the real mean hydrogen ion concentration of gastric secretion is 30 times more than that obtained by converting the average of the pH values. The implications are that our older textbooks and published articles which give mean pH values are wrong, since these mean pH values are not the true mean hydrogen ion concentrations even if the latter are expressed in pH notation.

The problem is further compounded where standard deviations are concerned. The growing laboratory practice of indicating the degree of abnormality of a particular bio-

pH values and SI equivalents (mol/l) of blood and gastric juice

pH	SI equivalent
<i>Blood</i>	
7.2	63×10^{-8}
7.4	40×10^{-8}
7.6	25×10^{-8}
Average 7.4	42.6×10^{-8} **
<i>Gastric juice</i>	
7.0	10×10^{-8}
5.0	10×10^{-4}
3.0	10×10^{-2}
Average 5.0	3.3×10^{-4} †

*but 42.6×10^{-8} mol/l = pH 7.37.

†but 3.3×10^{-4} mol/l = pH 3.52.

chemical measurement by the number of standard deviations by which that measurement differs from the normal mean imposes a heavy reliance on the validity of that mean. Further, if the standard deviation has been calculated in pH units and subsequently converted, then any connection between this and the true standard deviation is likely to be coincidental.

Fundamental to this is the underlying rationale of reporting biochemical data. Ideally to the clinician any departure from normality should be related to the extent to which that departure is a threat to health. If this threat is either alinear or asymmetrical about the mean, then reporting in terms of standard deviations either in SI mode or logarithmic (pH) mode is a cumbersome irrelevance. If the distribution of normal values for hydrogen ion concentration does not follow a Gaussian curve, then the simple linear scale proposed by the SI system offers no advantage to the clinician.

Could our biochemical colleagues give us guidance? The question is not so academic as it seems—how is excessive acid production to be identified or how is one to judge whether antacids or H^2 receptor blockers are better at controlling intragastric acidity?

P J TOMLIN

University Department of
Anaesthetics,
Queen Elizabeth Hospital,
Birmingham

Miscarriages as a cause of spina bifida and anencephaly

SIR,—The data presented by Professor K M Laurence and Dr C J Roberts (6 August, p 361) confirm much of those of Clarke *et al*¹ and would seem to indicate that the reproductive performance of mothers of anencephaly spina bifida (ASB) fetuses improves progressively if it is accepted that a miscarriage represents a greater disturbance than the survival of an ASB fetus beyond 28 weeks' gestation. The behaviour of the control group is predictable, since except at the extremes of the reproductive life span the maternal reproductive capacity remains relatively stable and at its maximum efficiency.²

However, the data from (ASB) families are, in my opinion, open to an alternative interpretation which, like that of Professor Laurence and Dr Roberts, does not lend support to the hypothesis that early miscarriages are the cause of malformations in subsequent pregnancies.¹ Indeed, the latter concept is extremely difficult to accept on teleological grounds since it would seem very unlikely that the major mechanism by which abnormal conceptuses are eliminated should in itself be the cause of the most common of human major malformations.

Postconceptional subfertility must by definition result from the loss of fertilised ova. The greater part of this loss is due to inherent defects within the conceptus and occurs before the first missed period, a relatively small proportion occurring as clinically manifest spontaneous abortions.³ A very small proportion of these defects result in late abortions and premature births. The evidence that the interval between miscarriage and the next pregnancy in both the ASB and control series is similar indicates that the very early losses must be comparable in both groups. Thus the differences in reproductive behaviour would appear to lie in the number of clinically mani-

fest abortions. I would therefore suggest that these differences are an indication that the elimination of abnormal conceptuses in ASB families is relatively inefficient. Since the mechanisms involved in this natural selection are unknown it is not possible to discriminate between the roles of maternal and embryonic factors in this process. However, it is perhaps significant that ASB has a relatively high survival rate compared with other morphologically less gross malformations.^{1,5}

Thus there may be at least two explanations for the apparent improvement in the reproductive performance of ASB families. The efficiency of the selective process may be improved directly or indirectly by successive pregnancies. Alternatively, the activity of the teratogenic insults resulting in ASB may fall below a critical threshold level as the number of pregnancies increases. Furthermore, the teratogenic insults may in themselves influence the efficiency of the selective process. Such an interaction is at least implied by Roberts and Lloyd,⁶ who suggested that variations in the abortion rate might account for the geographical variations in the incidence of ASB. Perhaps we should be asking why so many ASB pregnancies survive to term and how they differ from those that are eliminated in early pregnancy.

D I RUSHTON

Pathology Department,
Birmingham Maternity Hospital,
Birmingham

¹ Clarke, C, *et al*, *British Medical Journal*, 1975, **4**, 743.
² Talberg, G B, *American Journal of Obstetrics and Gynecology*, 1968, **102**, 451.

³ Witschi, E, in *Congenital Malformations: Proceedings of the Third International Conference*, ed F C Fraser and V A McKusick, p 161. Amsterdam, Excerpta Medica, 1970.

⁴ Nishimura, H, *et al*, *Teratology*, 1968, **1**, 281.

⁵ Creasy, M R, and Alberman, E D, *Journal of Medical Genetics*, 1976, **13**, 9.

⁶ Roberts, C J, and Lloyd, S, *British Medical Journal*, 1973, **4**, 20.

Advisory Committee on Borderline Substances

SIR,—It has been brought to my attention that there may be some doctors, particularly among those who have entered NHS practice in recent years, who would welcome information about the Advisory Committee on Borderline Substances (the ACBS), of which I am chairman. I hope the following outline of the functions and the status of my committee will be of interest to your readers.

Most of our colleagues will recall that when the MacGregor Committee—the Standing Joint Committee on the Classification of Proprietary Preparations—was wound up in 1970 it was agreed between the professions and the Health Departments that there was a need for continuing independent professional advice to doctors practising in the Health Service about the circumstances in which certain foods and toilet preparations might be regarded as medicines. This need arises because, as I understand it, there are no powers which enable Health Service authorities to provide anything other than drugs and medicines to patients who are living at home and being treated under the general medical services. The agreement resulted in the ACBS being set up in 1971.

We are a small committee—six doctors, including myself, who between us combine current experience in general medicine, gastroenterology, paediatrics, chemical pathology, dietetics, and general practice, and a

general practice pharmacist. Members are nominated in consultation with the appropriate professional bodies, and a secretariat consisting of medical, pharmaceutical, and lay officials is provided by the DHSS. Nevertheless, we order our proceedings as we think fit and we invite whichever professional colleagues we choose to give us the benefit of their opinions and participate in our deliberations.

It is open to doctors, whether as individuals or, say, members of medical service committees, to manufacturers, or to the Health Departments to request the committee to consider any substance or product; as a rule manufacturers are asked to provide evidence in support of the contention that a product should be regarded as a drug. Naturally the committee is always ready to reconsider any of its decisions in the light of new evidence. The flow of requests fluctuates, but usually the committee meets about twice a year. Immediately after each meeting the committee's views are notified to those who requested guidance and, after an interval to enable manufacturers, for instance, to comment or request a reconsideration, they are passed to the Health Departments and published as recommendations to the profession.

The *Monthly Index of Medical Specialties (MIMS)* prints the committee's recommendation in the "Borderline Substances" section of every issue, making appropriate amendments in the edition published in the month following that in which they receive notification of new recommendations. Similarly recommendations are published in the Drug Tariff.

Irrespective of what the committee may recommend, it is nevertheless for individual doctors to decide what to prescribe. Our recommendations can never be more than advisory—they are simply guidelines which we hope our professional colleagues will find helpful and time-saving. However, although we are not a statutory body and are wholly independent, the Health Departments take account of our recommendations when formulating their policy in relation to borderline substances. All concerned accept that prescriptions which are endorsed "ACBS" by the prescribers have been issued in accordance with those recommendations; consequently, in general, neither doctors' time nor Health Service resources need be wasted on inquiries or challenges concerning prescriptions that are endorsed in that way.

BARBARA CLAYTON

Department of Clinical
Pathology,
Hospital for Sick Children,
Great Ormond Street,
London WC1

Hospital appointment procedure

SIR,—May I be allowed to reply to the letter of Dr B Lee (3 September, p 645) with regard to a hospital practice to which he takes exception. The practice to which he refers is the one in which hospital outpatient clerks do not make appointments for patients on the telephone but only after a referral letter has been "considered." This practice is not current at the Middlesex Hospital. However, I personally feel that there are considerable advantages in following this procedure and have worked at hospitals where it is current practice.

Firstly, if there is a waiting list for patients to attend outpatient clinics it is possible for a consultant to examine the letter and decide

whether the patient should be given an immediate appointment at the next clinic, a fairly urgent appointment, or just a routine appointment at the end of the long waiting list.

Secondly, it is also possible for the consultant to ensure that a patient is being referred to the right clinic. In these days of increasing specialisation it is more frequent for patients to attend the wrong clinic at their initial visit. Over the past few months it has been my experience that it is a rare day when at least one or if not more patients attend the general surgical outpatient clinic when in fact they should have been given appointments for the urology clinic, the vascular clinic, or even the orthopaedic clinic. By examining the letter in advance such errors can be avoided and even if the letter is personally addressed to the consultant, surely the general practitioner would not take offence on receiving a reply from him that he thought that the patient concerned would be better treated by one of his colleagues.

RICHARD G FABER

Department of Surgical Studies,
Middlesex Hospital,
London W1

Medical manpower

SIR,—In response to Mr P R J Vickers (10 September, p 708) my estimates of the UK supply of newly qualified doctors (20 August, p 530) were based on University Grants Committee intake figures to the medical schools, with allowance for those who fail to complete the course or to take up a preregistration appointment. The estimates therefore included Conjoint students and I apologise for the loose employment of the word "graduates." The Irish situation was analysed by Oscar Gish in 1971¹ and continues to cause concern in the Irish Republic. However, the total annual output of the Irish Republic's medical schools is approximately 500; even if all the 50% who allegedly emigrate were to enter the United Kingdom this would not be a major factor in relation to other inflows from abroad. For the purposes of a model Irish doctors entering the UK can be regarded either as part of the total inflow from overseas or as part of the UK contribution. I agree that the second alternative would be the more logical, although for simplicity I had regarded their inflow *and outflow* as part of the approximate overseas totals.

Actual Department of Health and Social Security figures for 1976 show that in England and Wales there were 32 preregistration house officers born in Ireland—1.3% of the total. Irish-born senior hospital officers and registrars represented 1.7% and 2% of the respective totals (243 doctors altogether) and these figures included doctors born in Northern Ireland. This gives an indication of the actual current inflow and turnover of Irish doctors; I cannot see the extra 1000 doctors *a year* that Mr Vickers ascribes to his sources and I should not accept a 2% error in estimating the available work force as a factor which invalidated my conclusions. In any case validity is a relative term in this context; the more people are willing to experiment with testing the effects of different assumptions, the wiser we shall all become.

Professor S C Frazer's point about allowing in such models for part-time work (3 September, p 644) is very important. It can be done in various ways—for example, by estimating