my own experience a request for the estimation of amphetamine in urine is disconcerting to the biochemistry department of even major teaching hospitals and quite beyond the capacity and experience of most other laboratories.

I would be very interested to hear the feelings of psychiatrists about these points.—I am, etc.,

PATRICK G. M. G. WALKER.

Hartwood Hospital,
Lanarkshire.

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Rapid Estimation of Urea

SIR,—I was interested in the paper by Professor D. N. Baron and Dr. Gwilym Hughes (23 January, p. 233). From general practice my limited experience of Urastrat (see Table) encourages me to believe that this is a useful addition to the expanding range of simple biochemical tests.

Serum-urea Nitrogen on Same Samples of Blood

Patient	AutoAnalyzer (Expressed as Urea Nitrogen, mg./100 ml.)	Urastrat (mg./100 ml.)
1	10	17.5
2	11.6	15
3	14	13.8
4	17	18.8
5	25	22.5
6	27	27.5
7	29	25

By eliminating the need for centrifuge—or waiting for the blood clot to retract sufficiently—Baron and Hughes have brought this technique well within the capacity of the busy family doctor.

I wish to thank Dr. S. L. Tompsett, Biochemist, Northern General Hospital, Edinburgh, for the AutoAnalyzer results.

—I am etc.,

Edinburgh 5.

J. D. E. KNOX.

Folic-acid Deficiency in Pregnancy

SIR,—In your annotation "Lettuce for Mothers" (9 January, p. 75) you state that the most likely explanation of incipient deficiency of folic acid is that this substance has to be provided for the developing foetus. We should like to put on record the following case report which throws an interesting light on the mechanism of folic-acid deficiency in pregnancy.

A 23-year-old Indian, resident in this country for the past several years, became pregnant in February 1964. Her previous two pregnancies were normal. At the 32nd week her haemoglobin was 8.6 g./100 ml., and numerous macrocytes were present in the peripheral blood film. Oral administration of folic acid (10 mg. twice daily) was commenced. Six weeks later her haemoglobin was still 8.6 g./100 ml. Bone-marrow biopsy showed megaloblastic erythropoiesis. Her serum-vitamin-B₁₂ level (*Euglena-gracilis* method) was 280 µg./ml. and serum folate (*Lactobacillus-casei* method) 3.2 mµg./ml. In view of these findings oral folic acid was continued. There was a marked response in the 40th week, her reticulocyte count rising to 19%. A normal delivery occurred in the 42nd week and

at this time the haemoglobin and folate levels in mother and infant were:

Mother: haemoglobin 11 g. per 100 ml.; serum folate 2.5 mµg./ml.

Infant (cord blood): haemoglobin 16.8 g. per 100 ml.; serum folate 10 mµg./ml.

Three weeks later the mother's haemoglobin had risen to 14.2 g. per 100 ml.

More work is needed before a firm conclusion can be drawn from this, but the discrepancy between maternal and foetal levels of serum folate is suggestive of a unidirectional transfer of folic acid across the placenta resulting in probable interference with utilization of folic acid for maternal haemopoiesis. The sudden reticulocytosis in the 40th week suggests a reversal of folic acid transfer towards the mother.—We are, etc.,

A. K. SINGH.

N. K. SHINTON.

Coventry and Warwickshire Hospital,
Coventry.

Iron-deficiency Anaemia in Infancy

SIR,—Dr. James Grant (16 January, p. 193) is right to draw attention to the commonest nutritional disturbance of infancy now occurring in this country—namely, iron deficiency. The incidence of iron-deficiency anaemia in infants is not known but undoubtedly it is common. During the past 2½ months of 70 infants and children less than 3 years old admitted to one ward of an acute children's hospital 32 (45.7%) had a haemoglobin of 10.5 g./100 ml. or less, and of these 23 (33%) had less than 10 g./100 ml. Excluding those infants who were less than 6 months old (when iron deficiency is less likely to be the cause of anaemia), 26 out of 45 (57.7%) had a haemoglobin of less than 10.5 g./100 ml. and in 19 of these (42%) it was less than 10 g./100 ml. Although the anaemia was not fully investigated a stained film in nearly every case showed anisocytosis and hypochromia, and there is no reason to doubt that iron deficiency was the cause. Nearly all the patients were admitted because of acute respiratory infection, and, although this was a selected population in that the children were ill, it serves to emphasize the increased morbidity rate that occurs in iron-deficiency anaemia.

Since Helen Mackay demonstrated, over 30 years ago, that nutritional anaemia of infants was a preventable condition there has been little official action, although the general standard of nutrition has improved tremendously in other respects. A recent investigation by the Chicago Board of Health¹ has confirmed that a high incidence of iron deficiency in infants can be reduced by the addition of a small amount of iron to milk. 603 infants were fed from birth until they were 9 months old with a special milk preparation containing 12 mg. of elemental iron per quart (0.95 litre; a British quart is 1.13 litres). They were compared with a control group of 445 infants who were fed on evaporated milk without additional iron. Both groups received vitamin supplements. From the age of 26 weeks there was a significant difference in the mean haemoglobin concentration between the two groups. In the control group 337 (76%) became anaemic (Hb less than 10 g./100 ml.), 299 by the age of 1 year. In the study group 55 (9%) became anaemic, but in more than half of these it did not develop until six months to one year

after the iron supplement had been stopped. The morbidity from infection (especially respiratory infection) differed markedly in the two groups. Nearly 40% of the control group had a respiratory infection between 37 and 52 weeks of age compared with slightly less than 20% in the study group.

These results may not be generally applicable to conditions in this country, as the study was conducted in a poor quarter of Chicago, over 90% of the infants were non-white, and the illegitimacy rate was 30%. They do emphasize, however, that iron deficiency is an important factor in morbidity and that it can largely be prevented by the addition of a small amount of iron to milk. Although the majority of babies probably have sufficient iron at birth to satisfy their needs until they are weaned on to iron-containing foods, the minority who are not so satisfied is substantial enough to justify the addition of iron to all preparations of milk used for artificial feeding.—I am, etc.,

S. E. KEIDAN.

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Liverpool 12.

REFERENCE

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Chromosome Studies in Agammaglobulinaemic Subjects

SIR,—The concept that both "typical" and "atypical" agammaglobulinaemia are transmitted by a variety of inheritance patterns has been suggested by certain data.¹⁻⁵ Such a hypothesis raises two questions: Do patients with agammaglobulinaemia have a chromosomal abnormality? And, since the inheritance of "typical" agammaglobulinaemia is sex-linked, do apparently female subjects with this disorder lack one of the X-chromosomes?

In an attempt to answer these questions, we studied the karyotypes of seven patients with agammaglobulinaemia, none of whom showed evidence of an underlying disease such as leukaemia or lymphoma. Two were "typical" males in whom agammaglobulinaemia had developed in early infancy. In four subjects, three males and one female, the symptoms of agammaglobulinaemia had appeared during adult life and had persisted for 10 to 15 years. The seventh patient, an adult female, had idiopathic acquired agammaglobulinaemia and a thymoma. In these patients the serum-gamma-globulin levels were less than 150 mg./100 ml. (normal, 1,200–1,450 mg. by the method used in this laboratory). In an additional subject studied, a female, the serum content of each of the immunoglobulins (YG, YA, and Y1M) was approximately 40% of normal, suggesting a Lyon type of mosaicism.⁶

Specimens of peripheral blood were obtained, and leucocyte cultures were prepared by the method of Moorhead *et al.*⁷ for chromosome counting. Each of the eight subjects had a normal count of 46 chromosomes with apparently normal karyotypes. In a similar study of two patients with hypogammaglobulinaemia, Hanichi and Jordan⁸ also reported a normal count of 46 chromosomes; in both cases, however, the twenty-first pair of chromosomes were metacentric

rather than acrocentric. In our patients no such deviation was observed.

This work was supported by funds from the Committee on Research of the University of California School of Medicine and from the Research Committee of the Academic Senate, University of California, San Francisco, California.

—We are, etc.,

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Intravenous Plastic Catheters

SIR,—The timely warning by the Secretaries of the three Medical Defence Societies (19 December, p. 1600) regarding the hazards associated with the use of intravenous plastic tubing does not mention one predisposing factor—viz., the methods of sterilization employed. At present the majority of plastic catheters are sterilized by gamma radiation to an extent of 2.5 megarads. It is perhaps insufficiently known that some of the plastics employed in their manufacture change their molecular structure if exposed to irradiation of 5 megarads or, in some cases, lower dosages, becoming brittle in the process. This change is unfortunately very difficult to detect if the catheter is supported by a needle or stilette, and if it is to be kept sterile subsequent fracture within the lumen of the blood vessel may occur and emboli result.

It is important, therefore, that the degree of radiation given should be stated by the manufacturers on the package, together with the maximum permitted dose for the plastic concerned, thus indicating not only the safety margin but whether or not the plastics can be resterilized by this means if so required.

Case reports by Udwardia and Edwards¹ and Lewis² stressed the necessity of radio-opacity in such tubing, but by no means all manufacturers have yet introduced this. While there are no doubt production difficulties in changing the actual composition of the plastic, as an interim measure perhaps a contrasting coloured tip to the catheter might be incorporated, thus indicating to whoever takes the tubing out that it has all been removed. Although this in itself would not prevent cases of fracture it should stop their going undetected at the time and make speedier intervention possible than waiting for symptoms to develop.—I am, etc.,

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E. B. LEWIS.

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Longer Training for Radiographers

SIR,—My daughter is one of several impending leavers from her school who have been critically looking at possible careers and who are attracted to radiography, because of the (at present) reasonably short two-year training. These girls are well aware of the advantages of getting quickly trained for a job in a world where early marriage gives so little time for most women to use the training they have laboriously acquired.

I have yet to find a radiographer who thinks there is any point in raising the training course to three years. Let us hope that the radiographers themselves can resist the attempt to foist on them an unwanted, and as we can conclude from your correspondence columns unnecessary, prolongation of studentship.—I am, etc.,

DOUGLAS GAIRDNER.

Addenbrooke's Hospital,
Cambridge.

Plight of Hospital Junior Staff

SIR,—Following the recent revelations regarding the 25% brain drain and the crash in the number of Indians now reaching these shores, I have been waiting with considerable interest to observe what steps the now enlightened Minister will implement to assure continued hospital staffing.

As an unsubsidized member of the Commonwealth contingent myself and one fascinated by the current situation within the Health Service, I have been more than aware both of direct economic pressures to stay at home and of the complete absence of material incentives to stay here, since arrival here two years ago.

To the best of my knowledge, no relief is offered to hospital junior staff in that category, such as taxation modifications, non-payment of national or even health insurance, unemployment benefits while attending postgraduate courses (remembering that in most instances our primary reason for being here at all is postgraduate education, in one form or another), or passage assistance.

Consequently, it is with considerable amazement that I now see that the Minister has allowed himself to lose even more ground in being beaten to the punch by the new deterrent terms of the Royal College of Surgeons. While the elevation of the College's standards cannot be challenged, this news can come as nothing more than a further figure in the debit column in the minds of those gravitationally opposed gentlemen now contemplating joining your ranks from far away places—I am, etc.,

London W.12.

GRAHAM MYLNE.

SIR,—I read the letter from Dr. S. Gallannaugh (23 January, p. 254) with interest. I feel that hospital junior staff suffer from a great disadvantage in that there is no one to represent their interests at Ministry level. The Royal Colleges are interested only in the affairs of consultants—especially those employed by London teaching hospitals—and the B.M.A. is primarily an organization to represent general practitioners. Thus it is easy to understand how the exploitation of junior

hospital staff has continued year by year. For example, the deduction for residence is almost unique in this country—in industry employees are reimbursed for meals and lodging undertaken in the course of their work in most instances. In many hospitals the management committees frankly agree that the accommodation is well below standard—yet the full deduction for residence is still taken with the approval of the B.M.A., who will not support any demand for a reduction for the astonishing reason that these hospitals would have difficulty in obtaining staff.

No one, anywhere, considers that he is paid enough, but hospital junior staff would appear to have a better claim than most. Many graduates enter industry now at salaries between £900 and £1,000 a year—a glance at the “situations vacant” in “quality” Sunday papers will confirm this. The newly qualified doctor starts at £770 a year, less £175 for residence. If he stays in the hospital service he will be earning £1,710 as a first-year senior registrar at the age of 33–35—a highly skilled man with considerable responsibility and long hours. Meanwhile, his contemporaries in industry will probably by this time be running a car on the firm with perhaps an expense account and be earning between £2,000 and £3,000 a year—and good luck to them. It is their good fortune to work in an open market—hospital junior staff must needs work for a monopoly.

It is hardly wise to exploit every doctor who first joins the National Health Service. I understand that in the secluded halls of the Ministry of Health they have proved that doctors aren't emigrating to better conditions—all I can say is that two more will be joining the “ghost drain” next year—my wife and myself.—I am, etc.,

Cheriton Fitzpaine,
Devon.

DONALD MACKENZIE.

Complaints Against Doctors

SIR,—Sixteen months after a complaint against me by a patient, 12 months after the case was dismissed without a hearing by a medical service committee, and four months after a hearing by the tribunal of the complainant's appeal I was informed that the Minister was satisfied that there was no substance in the complaint and that there were no grounds for supposing that I “had fallen from the highest standards to which [my] profession could aspire.” The Minister further stated that my attempts to render the best possible care were frustrated through no fault of my own.

My relief at such a complete acquittal was mixed with a bitterness which prompts the following reflections. Why should I and my family have been disturbed by this affair for sixteen months? How much more disturbing must such a delay be for doctors whose cases are not so clear cut. Apart from the costs incurred by my medical defence society and the incalculable cost to me in anxiety and in the time spent in preparing my case, I was £20 out of pocket. I understand that the complainant was assured in advance that she need not worry about costs. But, I ask, if costs are not demanded from the complainant in a case in which there is found to be no substance, in what sort of case