Classification). There were 27 spontaneous deliveries, 8 forceps deliveries, and 9 caesarean sections. In brief, there was a sharp fall in C.V.P. on delivery of the child in every case. During the third stage of labour the C.V.P. ranged from -2 to $+9$ cm. H₂O (zero level was the sternal angle). Each patient received ergometrine 0.25 mg. or 0.5 mg. intravenously, sometimes before and sometimes after placental separation. Placental separation and the injection of ergometrine produced small and transient rises in C.V.P. (never more than 3 cm. H₂O and never lasting for more than 4 minutes). Blood loss was measured at these deliveries and was of the anticipated magnitude.^{1,2} It is believed that the direct effects of ergometrine on the veins were to a variable extent cancelled out by the effects of haemorrhage.

The period after delivery of the child is a dangerous time for the patient with heart disease. Bearing in mind the several and major concurrent alterations in the circulatory state which may occur at this time and the absence of any major rise in the C.V.P. in 44 patients, one wonders whether the deaths which have occurred at this time are due, as is often stated, to the effects of ergometrine. One must weigh the risks of haemorrhage against the risks of ergometrine. I believe that a dose of up to 0.25 mg. of ergometrine is, on balance, less hazardous than a third-stage haemorrhage for the patient with severe heart disease. Pulmonary oedema if it develops may not be due to the ergometrine and is usually treatable. As an obstetric anaesthetist, while not advocating the routine use of general anaesthesia and operative delivery for patients with serious heart disease, I mention the control of oxygenation attainable during modern anaesthesia and the potential benefits of intermittent positive pressure ventilation on pulmonary oedema.—I am, etc.,

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Errant Genes

SIR,—In your leading article "Errant Genes" (7 February, p. 315) you state: "Thus, in phenylketonuria there is a deficiency of the enzyme phenylalanine hydroxylase, so that phenylalanine cannot be converted to tyrosine. The resulting excess of phenylalanine in the blood is toxic to the growing brain, causing mental retardation and fits."

The evidence that phenylalanine is responsible for the neuropathological aspects of phenylketonuria can only be described as sketchy. Absence of phenylalanine hydroxylase shunts phenylalanine into alternate oxidative pathways, resulting in the formation of phenyllactic, phenylpyruvic, and phenylacetic (converted to phenylacetylglutamine) acids.¹ We cannot yet say with certainty whether it is phenylalanine or the oxidized derivatives which are mainly responsible for the effects of the disease on the nervous system. If we could be sure that

phenylalanine alone is responsible, then it may well be indirectly via an inhibitory effect on Dopa-decarboxylase reducing the concentration of transmitter substances in the synapses.²—I am, etc.,

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Recurrent Virus Meningitis

SIR,—Dr. J. P. Anderson (27 December, p. 786) reports a case of a patient who had two separate attacks of aseptic meningitis with different viruses as aetiological agents. He states that "a review of the literature and correspondence with colleagues of wide experience have not revealed any further virologically proved examples of such double attacks."

However, a paper entitled "Multiple attacks of Aseptic Meningitis in the Same

Individual" by K. Lapinleimu and myself was published in the *B.M.J.*¹ Multiple attacks were established in four patients: in two adults, one three times and the other four times, and in two children, twice in each. The intervals between the individual attacks were from four months to eight years. An enterovirus isolation from the stools succeeded in 5 attacks out of 11. Antibody responses gave us strong reason to believe that the attacks were caused by the viruses isolated. In a sixth attack serological evidence of infection with E.C.H.O. 7 was obtained. In two patients different viruses appeared to be responsible for the successive attacks of meningitis.

Since publishing the above-mentioned paper, six further patients who have had more than one attack of aseptic meningitis of proved or probable viral aetiology have been treated at the Aurora Hospital.—I am, etc.,

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Unnecessary X-rays?

SIR,—While having great sympathy with Mr. A. W. Fowler (7 February, p. 632) in his desire to remove all legal considerations from the decision as to whether an x-ray should be advised, I feel that he has oversimplified the issues.

It may be true, as he says, that "no fracture in a limb which is not clinically obvious will suffer from delay in diagnosis for three days." When, however, a three-day delay in diagnosis occurs and negligence is alleged, it will be impossible to deny the extra three days' pain and suffering. Very possibly also the plaintiff will allege that the position of the fracture has worsened during the three days, and may produce an expert witness to testify that earlier reduction might have been expected to obtain a better result. This is but one example of the difficulties which may follow the course proposed.

Regarding the recommendation that the number of calls on the duty radiographer after 5 p.m. should be reduced, we think it very much open to question whether any department accepting casualties should be without immediate x-ray facilities. Certainly hospital junior staff should not, in our view, be subjected to any pressure whatever to avoid or postpone x-rays which they feel to be necessary. If things go wrong it is the casualty officer who will be blamed, and if he is capable of being left in charge of a casualty department he is equally capable of deciding when to order an x-ray. In particular, failure to order an x-ray because the case is one of "simple" concussion is, we feel, fraught with danger.

The casualty officer is more exposed than is any other doctor to allegations of negligence and is deserving of every support from the ancillary services. Better to press the authorities to provide improved radiographic services than to seek to reduce the calls made upon them.—I am, etc.,

H. A. CONSTABLE,

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SIR,—There is one particular situation in which I must strongly disagree with the views expressed by Dr. R. M. Scott (13 December, p. 689) and Dr. W. B. James and others (10 January, p. 110). Any injury in a child under the age of two makes a complete skeletal survey mandatory. No matter how plausible the story, such an infant must be considered to be an instance of "battered baby syndrome" until proved otherwise. Only radiological examination of the whole child will reveal old and healing injuries, which are virtually pathognomonic. It is also worth remembering that any subsequent battering carries a 10% mortality.—I am, etc.,

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SIR,—The letter from Mr. A. W. Fowler (7 February, p. 362) is an excellent summary of the considerations which should govern the request for an x-ray examination.

This is summarized by the advice which I have always offered to medical students and young residents: "Never ask for an x-ray examination if the result will not change the treatment of the case."—I am, etc.,

D. C. STAVELEY.

Alford, Lincs.

Fibrin Degradation Products and Menstruation

SIR,—I read with interest Mr. H. K. Basu's paper (10 January, p. 74) and his contention that higher concentrations of fibrin degradation products in cases of menorrhagia may indicate increased local fibrinolytic activity in the uterus.

That the uterus is a potent source of plasminogen activator to the systemic cir-

culation is indicated by our findings^{1 2} that in blood obtained from the uterine veins this factor was greater than that in the arterial blood. Plasminogen activator levels were estimated by the euglobulin lysis time (E.L.T.) method.³

Evidence supporting our findings is provided by the observations published by bination of phenformin-stanozolol is as Maki *et al.*⁴ These workers, investigating the fibrinolytic activity in blood from the vasa efferentia of the uterus and comparing it with that in blood from a cubital vein, found that this activity was considerably increased in the blood from the uterus. They suggested that this constituted indirect evidence that the uterus contributed activators to the systemic circulation. Moreover, in a comparative study of blood from a uterine vein and a uterine artery in 14 patients, Cash,⁵ using the E.L.T. method, found marked increased fibrinolytic activity in the former.—I am, etc.,

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Vagotomy for Peptic Ulceration

SIR,—I am indebted to Mr. H. Burge for his communication (31 January, p. 301) as this gives me an opportunity to explain to him why he has failed to use the leuco-methylene blue dye successfully to detect the vagus nerve branches in the operation of vagotomy. I fear that Mr. Burge's lack of success with this perfectly simple procedure must be due entirely to his failure to apply the technique correctly. The leuco-methylene blue is most effective in detecting even the smallest branches of the vagus nerve, which he describes, quite rightly, as being almost hair-like in size. Without using the leuco-methylene blue dye it is a physical impossibility to seek out these tiny tendrils, so militating against the success of the vagotomy operation.

I must also make the point that the dye is not used to "test" the completeness, or otherwise, of vagotomy but to aid the operator in identifying the nerves before removal. If the surgeon wishes to use the Burge electrical stimulation test after completion of the operation, then that is fine.

May I appeal to Mr. Burge, therefore, to use the leuco-methylene blue dye properly, when, I can assure him, he will find, as I and many others do, that the dye does indeed show up clearly the hair-like branches mentioned in his letter. In support of this, I can show Mr. Burge a number of pathological reports selected at random and relating to tissue removed at vagotomy, which show that after a selective or total

vagotomy that 75% of specimens excised after staining were indeed nervous tissue, thus showing that the dye can detect these fibrils after the main trunks have been dealt with.—I am, etc.,

MAURICE LEE.

London W.1.

Pertussis Vaccine as Immunological Adjuvant in Leukaemia and Lymphoma

SIR,—We read with great interest the report of Drs. R. J. Guyer and D. Crowther (15 November, p. 406) on the possible delay of the onset of relapse in patients with acute lymphoblastic leukaemia who were brought into remission first by conventional chemotherapy, and then were treated with *Bordetella pertussis* vaccine.¹

Early in 1967 we observed that treatment with *Bordetella pertussis* vaccine exerted immunosuppressive effect in mice. In these low-leukaemia mice no pyroninophilic lymphoid cells were mobilized in the spleen upon stimulation with phytohaemagglutinin² and a cell-grafted antigenic lymphoma showed an accelerated course of growth.^{2 3} Recently, we found that intravenous treatment of high-leukaemia A.K.R. mice at birth with *Bordetella pertussis* vaccine induced a leukaemoid reaction. However, at the tenth month of life, a 10-fold decrease in leukaemia was observed in the treated group, as contrasted to sham-treated control A.K.R. mice.⁴—We are, etc.,

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Miliary Tuberculosis in the Elderly

SIR,—Since so little is being published on tuberculosis in the world's medical literature, it is encouraging to read Dr. A. T. Proudfoot and colleagues' article (3 May, 1969, p. 273) and also your leading article on the same subject (p. 265).

Tuberculosis among older adults and elderly people remains a serious problem. In a few countries, including Canada, Britain, Holland, Scandinavian nations, and the U.S.A., where preventive methods have protected infants and children against invasion of tubercle bacilli for several decades, there has been phenomenal reduction in clinical disease in people born during that era. However, older adults and the elderly people of today were infected in large numbers as children before these preventive measures were established.¹ Many of those

who have survived are still harbouring tubercle bacilli in caseous material in encapsulated lesions of primary tuberculosis complexes. These lesions which are avascular, do not recrudescence, but in a small percentage of them nature resorbs parts of walls of capsules and tubercle bacilli are evacuated without other change in the primary lesions. Wherever the evacuated tubercle bacilli lodge they result in endogenous reinfections on allergic tissue, resulting in such conditions as effusions in serous spaces and chronic pulmonary tuberculosis. Evacuation of tubercle bacilli into a lymphatic or blood vessel results in miliary tuberculosis. This may occur in the absence of other overt disease, and therefore is the first manifestation of clinical tuberculosis.

This situation must be expected to continue whenever older adults and elderly people are harbouring encapsulated lesions of primary complexes. The problem will not be solved until these individuals have been replaced by oncoming generations who have been successfully protected against invasions of tubercle bacilli. In some places this changing situation is now in evidence. In the State of Minnesota in 1954 a county-wide tuberculin-testing survey revealed that 47.7% of men from 50 to 59 years and 44.1% of women of the same age reacted to tuberculin.² However, testing in the same state in 1967 revealed that 6.3% of men and women of 50 to 59 years reacted. Among those of 60 years and older, 10.5% reacted to tuberculin. In the same state in 1967 all of the deaths from tuberculosis were in people of 45 years or older, and of the new cases reported that year 83% were in that age period.

When the time comes in any area that no person in the earlier decades of life is invaded with tubercle bacilli there will still be well-encapsulated lesions of primary complexes in the bodies of some elderly people. In the old-age period tuberculosis remains one of the world's most serious diseases. Therefore the diagnostic and therapeutic procedures practised and recommended by Dr. Proudfoot and his coauthors should be adopted by the medical profession everywhere if the tubercle bacillus is to be prevented from spreading from elderly people back to infants and children.—I am, etc.,

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Renin and Acute Renal Failure

SIR,—I was interested to read the findings and hypotheses put forward by Dr. J. J. Brown and others (31 January, p. 253) regarding oliguric renal failure. As they say, plasma renin activity is increased in patients with cirrhosis and ascites and may be accompanied by diminished renal blood flow and failing renal function.

In work to be published shortly¹ my former colleagues and I have shown a significant inverse relationship ($r = -0.59$, $P = <0.05$) between plasma renin activity and the renal clearance of para-aminohippurate in 13 such patients. However, when clearance of para-aminohippurate was increased (mean increase 58%) by a constant intravenous infusion of dopamine, plasma renin