first discovered to be hypertensive two months before her myocardial infarction. The third patient was a single girl from the Continent who had taken oral contraceptives for three years. We have no previous medical records about her.

We do not consider that our report of 22 women under the age of 45 years with acute myocardial infarction represents "a small amount of inadequate information" upon which to base recommendations. It is the largest series yet assembled and we were particularly careful not to draw over-emphatic conclusions.—We are, etc.,

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SIR,—In the introduction to the article by Drs. Dorothy J. Radford and M. F. Oliver (25 August, p. 428) references are cited to reports in which an association between oral contraception and the occurrence of myocardial infarction is claimed. One of the reports referred to is that by Hartveit¹ which describes the case of a 32-year-old woman who died in Bergen, Norway, in 1964, apparently of the consequences of myocardial infarction. The same case has also been described by Høsteng.² References to both these reports can be found in a number of other, later articles.

As a result of legal proceedings directly concerned with this case I had the opportunity to study the case-notes thoroughly and also to re-examine the histological material. I subsequently came to the conclusion that this was not a case of myocardial infarction as a consequence of primary thrombosis but rather—and there were a number of positive indications to support my opinion—a case of chronic myocarditis accompanied by coronary arteritis, neuritis, and pericarditis. The heart was dilated with large areas of mottled yellow colour. Microscopical examination revealed pronounced and diffuse leucocyte infiltration with no border zones, including muscles, vessels, and nerves. A large number of scattered fibrous areas were found, all of them showing leucocyte infiltration. No coagulation necrosis was found; on the contrary, the nuclei of the muscle fibres were large and prominent.

In view of the foregoing I would suggest that there is no longer any justification for including the case described by Hartveit and Høsteng in lists of references on the subject of oral contraceptives and myocardial infarction.—I am, etc.,

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¹ Hartveit, F., *British Medical Journal*, 1965, 1, 60.
² Høsteng, T. O., *Tidsskrift for den Norske Lægeforening*, 1965, 85, 1692.

Incidence of Idiopathic Venous Thromboembolism in Nurses

SIR,—The interesting paper by Surgeon Lieutenant L. E. Ramsey and Surgeon Lieutenant-Commander M. A. MacLeod (24 November, p. 446) suggesting a high incidence of idiopathic venous thromboembolic disease among nurses requires a note of

caution before alarm is spread within the nursing profession. In our experience clinical symptoms and signs do not lead to "a very low incidence of false positive diagnosis" of deep vein thrombosis (D.V.T.).

Over the past 21 months (March 1972–November 1973) 37 women, including seven nurses, between the ages of 14 and 45 years have been referred to us with a clinical diagnosis of idiopathic D.V.T. Satisfactory ascending venograms were obtained in 35 patients, including all the nurses. Thrombosis was confirmed in only 11 cases (table I), indicating a false positive clinical diagnosis in nearly 70%. When we applied the clinical criteria used by Drs. Ramsey and MacLeod for the diagnosis of idiopathic D.V.T. we were left with 26 cases; in only nine of these was thrombosis confirmed venographically, a false positive clinical diagnosis rate of 65%.

TABLE I—Patients with Clinical Diagnosis of D.V.T.

D.V.T. Clinical Severity Score	Nurses		Others	
	"Pill"	No "Pill"	"Pill"	No "Pill"
1 point	1 (0)	—	—	2 (1*)
2 "	5 (0)	—	10 (2)	4 (1*)
3 "	1 (0)	—	6 (3)	1 (0)
4 "	—	—	7 (6)	—
Total	7 (0)	—	23 (11)	7 (2*)

Pain, tenderness, temperature difference between limbs, and pitting oedema each scored one point. Figures in parentheses = no. with positive venograms (* = equivocal venograms).

We believe that most cases of D.V.T. occurring in this area are sent to the Radcliffe Infirmary and then referred to us. The estimated incidence (per thousand population per year) of idiopathic D.V.T. in women of child-bearing age in our catchment area is shown in table II. The calculations are based on information from the population records of the Oxford Regional Hospital Board—1,600 nurses (whole-time equivalents) and 88,500 others.

TABLE II—Estimated incidence (1,000/yr) of D.V.T. in women of child-bearing age in the Oxford Area

Method of Diagnosis	Nurses	Others	Total
Clinical	2.50	0.19	0.23
Venography	0.00	0.07	0.07

All seven nurses in whom the clinical diagnosis of D.V.T. had been made were taking the "pill" but none had a D.V.T. proved venographically. Of the 30 others, 23 (77%) were on the "pill" and 11 of these had proved D.V.T. The clinical severity score (table I) was low (1 or 2) in six nurses; in the others the score tended to be higher (3 or 4) in those on the "pill" compared with those not on the "pill." The higher the score, the greater was the likelihood of a positive venogram.

These data suggest that nurses seek medical advice and are referred by their doctors even with relatively mild symptoms, which are not necessarily due to D.V.T. Part of the explanation for this may be that nurses and doctors are particularly aware of an association between D.V.T. and oral contraceptives. This does not appear to be the case in the general population, however, because women using oral contraceptives who were referred to us had notably more severe clinical disease than women not on

oral contraceptives. A closely similar observation was made by Vessey and Doll.¹ They found that the use of oral contraceptives was less frequent among those in whom the clinical diagnosis of D.V.T. was less certain. It is unlikely, therefore, that the observed association between D.V.T. and oral contraceptives is due to a greater tendency to diagnose D.V.T. in users of oral contraceptives. Further positive support for an association between D.V.T. and oral contraceptives is provided by the fact that all the women in our series with venographically proven D.V.T. were using oral contraceptives.

In conclusion, we cannot agree that nursing predisposes to idiopathic venous thrombosis.—We are, etc.,

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¹ Vessey, M. P., and Doll, R., *British Medical Journal*, 1968, 2, 199.

Aspiration of Thermometer Fragment

SIR,—Among the most common measurements in medical practice is the recording of body temperature. This is considered a harmless procedure and only a very few accidents have been reported in this context. The implications of such an event can, however, be quite serious, which prompts us to report the following experience.

A 33-year-old white woman had an episode of sharp left flank pain lasting for about 45 minutes before presenting in the emergency department of our hospital. During the process of recording her oral temperature the patient had a seizure, fractured the thermometer, and aspirated part of it. It was later found out that she had had a long-standing seizure disorder. On physical examination the patient was in no acute distress and no significant findings were noted.

Chest radiographs revealed the proximal fragment of the thermometer in the right lower lobe (see fig.). On bronchoscopy it was seen firmly wedged in the medial basilar segmental bronchus of the right lower lobe and repeated attempts to remove it were unsuccessful. It was successfully removed, however, after thoracotomy and bronchotomy. The flank pain for which the patient sought help in the first instance did not recur while the

patient was in the hospital and was thought to be mittelschmerz (the patient had had her last menstruation two weeks previously).

Mercury deposited in the lung can be absorbed into the blood stream because elemental mercury readily diffuses through the lipid-containing alveolar walls. This, however, is not necessarily fatal.¹ The hazard of broken thermometers would be mainly from the broken glass rather than the mercury itself.² So far as we can determine from various sources it is a common practice for nursing personnel to put thermometers in patients' mouths and leave them unattended both in the inpatient and outpatient department. This can also be construed from the case report of Johnson and Parker.³ Though we did not find a case similar to ours in the literature and believe this to be a rare occurrence, an unfortunate event like this could easily be prevented by taking proper precautions, at least in the vulnerable population.—We are, etc.,

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- 1 Wallach, L., *New England Journal of Medicine*, 1972, 287, 178.
- 2 Mofenson, H. C., and Greensher, J., *Journal of the American Medical Association*, 1973, 223, 559.
- 3 Johnson, E. W., and Parker, W., *Journal of the American Medical Association*, 1972, 221, 303.

Maternal Blood Group A and Pre-eclampsia

SIR,—Blood group A predisposes to a number of pathological states. These include carcinoma of the stomach,¹ venous thromboembolic disease in pregnancy and oral contraceptive therapy,² coronary artery thrombosis,³ and chorion carcinoma.⁴

In clinical practice severe fulminating pre-eclampsia was noted to be commonly associated with group A blood. Two retrospective surveys were therefore undertaken to see whether group A mothers were more likely to develop pre-eclampsia than those with blood of group O. In the first study the incidence of pre-eclampsia in group A and group O primigravidae was compared. Pre-eclampsia was defined as a rise of diastolic blood pressure to 90 mm Hg or more on two or more occasions in the second half of pregnancy, associated with either oedema or proteinuria. Hypertension occurring for the first time in labour was not included. In the second study the incidence of group A was determined in patients with moderately severe or severe pre-eclampsia. In these patients the diastolic blood pressure was 100 mm Hg or more and proteinuria was present. In 400 unselected maternity patients the incidence of group A was 43% and of group O 45.5%.

In the first study 35 out of 103 group A primigravidae developed pre-eclampsia compared with 18 out of 101 group O primigravidae. The relative risk (A:O) of pre-eclampsia was therefore 2.7:1. In the second study 31 out of 47 patients with moderately severe or severe pre-eclampsia were of group A and 10 were of group O. Without allowing for the greater frequency of group O in normal maternity patients this gives a relative risk rate of 3.1:1.

The pathogenesis of pre-eclampsia is not fully understood. It is known, however, that the level of fibrin breakdown products is elevated, suggesting a process of disseminated intravascular coagulation, and Page⁵ suggested a hypothesis for the pathogenesis of pre-eclampsia based on this process.

It is interesting to note that the relative

risk (A:O) for developing venous thrombosis while on oral contraceptive therapy—2.8:1²—is similar to the risk found in this study for the risk of pre-eclampsia—2.7:1. The increased risk to patients with group A of developing pre-eclampsia may therefore be another manifestation of an increased tendency to intravascular coagulation in this group.—I am, etc.,

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- 1 Aird, I., Bentall, H. H., and Roberts, J. A. F., *British Medical Journal*, 1953, 1, 799.
- 2 Jick, H., et al., *Lancet*, 1969, 1, 539.
- 3 Mourant, A. E., Kopec, A. C., and Domaniewska-Sobczak, K., *Lancet*, 1971, 1, 223.
- 4 Dawood, M. Y., Teoh, E. S., and Ratnam, S. S., *Journal of Obstetrics and Gynaecology of the British Commonwealth*, 1971, 78, 918.
- 5 Page, E. W., *Journal of Obstetrics and Gynaecology of the British Commonwealth*, 1972, 79, 883.

Influenza Vaccination

SIR,—With reference to the letter from Dr. J. D. Avison (10 November, p. 358) quoting Tauraso *et al.*¹ on the effects of giving influenza vaccine intradermally, it is important that the conclusions of these authors are examined fully. In accepting that an intradermal inoculation of vaccine in an amount equivalent to one-fifth the subcutaneous dose should be considered, Tauraso *et al.* mentioned that a disturbing feature about the use of the intradermal route is that it is technically complicated and requires well-trained personnel to perform the injections.

If one were to administer a 0.1-ml dose by the intradermal route but inadvertently to inject it subcutaneously, the recipient, instead of receiving his immunization by the better route, would receive it by the less favourable one. With the jet injector a small amount of leakage may occur. Small leakage from a subcutaneous injection makes little difference to the immunity conferred. A similar leakage from an intradermal dose would result in little or no protection.

One further factor to consider is that the intradermal vaccination appears to be more painful and has a higher rate of local reactions, thus reducing the acceptability of such injections.—I am, etc.,

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- 1 Tauraso, N. M., et al., *Bulletin of the World Health Organization*, 1969, 41, 507.

Ventricular Dysrhythmias and Thioridazine in Alcohol Withdrawal

SIR,—The occurrence of ventricular dysrhythmias associated with the use of thioridazine hydrochloride in patients withdrawing from alcohol reported by Dr. M. A. Sydney (24 November, p. 467) demands comment since his conclusions are questionable.

He correctly points out that severe hypokalaemia is a recognized complication of chronic alcoholism, producing ST-segment and T-wave abnormalities and U waves in the electrocardiogram. Vetter *et al.*¹ reported that in a series of 50 patients 64% were hypokalaemic and 18% severely depleted in

potassium (less than 2.5 mEq/l). Of these patients 28% had cardiac dysrhythmias on admission and in one case death occurred following irreversible ventricular tachycardia. I would therefore endorse that determination of serum potassium levels and routine electrocardiograph recordings form part of the basic management of patients after acute alcohol withdrawal.

It is unfortunate, however, that the ventricular dysrhythmias arising in the two patients reported should have been aetio-logically linked to thioridazine hydrochloride administration. There is no information in either case as to the clinical features prior to the episodes and one patient was on other drug therapy. In particular, in delirium tremens agitation, irritability, and convulsions commonly occur² and particularly when associated with severe hypokalaemia may contribute greatly to inducing ventricular dysrhythmias. In these two patients thioridazine hydrochloride, a useful and relatively safe drug, was given in modest dosage and there is little, if any, reason to conclude that its administration was implicated in the problems that arose.—I am, etc.,

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- 1 Vetter, R., Cohn, L. H., and Reichgott, M., *Archives of Internal Medicine*, 1967, 120, 536.
- 2 Isbell, H., Belville, R. E., and Wikler, A., *Quarterly Journal of Studies on Alcohol*, 1955, 16, 1.

Effect of Polyunsaturated Fatty Acids on Lymphocyte Activity

SIR,—With reference to the letter from Dr. J. Mertin (10 November, p. 357) it is important to bear in mind that polyunsaturated fatty acids (PUFA) are only one of a number of factors which may influence the interaction of sensitized lymphocytes with specific antigen *in vivo*, and that the final intensity of the reaction may represent the algebraic sum of enhancing and inhibitory influences. Important among the latter may be a serum factor which appears to be "tailor-made" to the autologous lymphocytes in that it is more effective in suppressing these cells than those from another individual.¹ This lymphocyte depressing factor (L.D.F.) may well be identical with the α_2 -macroglobulin described by Cooperband *et al.*^{2,3} as immunoregulatory. Despite its being a potential physiological regulator, no serious attempts appear to have been made to manipulate L.D.F. therapeutically.¹ In general the level of L.D.F. is elevated in all conditions^{4,5} which lead to lymphocyte sensitization so that it may act in "dampening down" over-reaction to biologically unimportant stimuli.

That the L.D.F. mechanism is distinct from that of PUFA is shown by some recent studies in which a rise in linoleic acid-like activity after an oral dose of linoleic acid was followed with the macrophage electrophoretic mobility (M.E.M.) test⁶ on the interaction of normal lymphocytes with thyroid (F1) antigen. Serum was prepared at intervals after an oral dose of 10 ml of a purified linoleic acid (kindly supplied by Bio-Oils Research, Ltd., Nantwich) and separated into an ether-soluble fraction (containing linoleic acid) and an insoluble fraction (containing protein). It can be seen