registrars or inexperienced surgeons, since precision is required within narrower limits than for trifin nailing, it is certainly not true in centres where these methods are employed by surgeons willing to devote the necessary time and effort to master a slightly more difficult, but very much more efficient technical procedure. Writing in the *BMJ* as long ago as 1969 Barnes² described the trifin nail as the "least effective method in common use" and stated that it should be restricted to the undisplaced or impacted subcapital fracture.

Secondly, Mr Ring states that "no method of internal fixation, however secure, can overcome the problem of the avascular femoral head." This is not necessarily so provided good reduction is also present. Garden³ has examined the long-term results of a consecutive series of 323 healed displaced subcapital fractures and shown that, with scarcely an exception, the fate of the femoral head is directly related to the quality of reduction and its maintenance until union is present. From his findings the fact emerges that anatomically reduced fractures, whatever their initial degree of displacement, will not only unite if securely held but will also normally escape the late secondary changes usually attributed to avascular necrosis.

It is still insufficiently appreciated that these late secondary changes (now usually described as "late segmental collapse"), which appear after union and most commonly not until the second or third postoperative year, usually constitute a mild and comparatively easily manageable complication in the majority of the elderly patients affected, most of whom are able to continue to cope with life's demands and retain their activity without the need for further surgery. Of 53 patients with united displaced subcapital fractures treated by triangle pinning⁴ who survived a three-year follow-up, 21 showed some radiological evidence of collapse, but only four of these patients had sufficient disability to require secondary surgery, while in the remaining 17 symptoms were either slight or absent altogether. A similar picture of late segmental collapse emerges from the Barnes survey already mentioned.¹

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¹ Barnes, R, *et al*, *Journal of Bone and Joint Surgery*, 1976, **58B**, 2.

² Barnes, R, *British Medical Journal*, 1969, **2**, 575.

³ Garden, R S, *Journal of Bone and Joint Surgery*, 1971, **53B**, 183.

⁴ Smyth, E H J, and Shah, V M, *Injury*, 1974, **5**, 197.

SIR,—Dr G K Morris and Professor J R A Mitchell (8 January, p 108) state that in the management of hip fractures "prophylactic anticoagulation is tedious and not without complications, but it will prevent pulmonary embolism." Undoubtedly, the efficacy of oral anticoagulants in preventing pulmonary embolism is proved.^{1,2} However, it is perhaps the complications that deter 97% of orthopaedic surgeons from routine use of these drugs.³

Firstly, anticoagulant therapy carries its own mortality even in elective hip surgery in carefully screened cases.⁴ Secondly, the morbidity from postoperative wound bleeding and haematoma formation is increased^{1,2,4-6} when oral anticoagulants are used. The wound haematoma is viewed with particular dismay by the orthopaedic surgeon because of the risk of consequent "deep" sepsis involving the

metal implant.⁴ Infection of the implant is an unmitigated disaster which causes the failure of the operation and can itself produce a significant death rate. In a recent review of 85 patients undergoing operation at this hospital for femoral neck fractures there were six cases of postoperative deep sepsis and each of these patients died within three months.⁷ This series is too small to be conclusive, but then there is no information at all about infection in either of the two major publications which advocate the use of anticoagulants. Until there is there is unlikely to be any wider acceptance of a method with these potential hazards and which is also "tedious."

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¹ Seivitt, S, and Gallagher, N G, *Lancet*, 1959, **2**, 981.
² Morris, G K, and Mitchell, J R A, *Lancet*, 1976, **2**, 869.

³ Morris, G K, and Mitchell, J R A, *Lancet*, 1976, **2**, 867.

⁴ Crawford, W J, Hillman, F, and Charnley, J, Centre for Hip Surgery, Wrightington Hospital, Publications No 14, 1968.

⁵ Hamilton, H W, *et al*, *Journal of Bone and Joint Surgery*, 1970, **52B**, 268.

⁶ Salzman, E W, and Harris, W H, *Journal of Bone and Joint Surgery*, 1976, **58A**, 903.

⁷ Waddell, G, personal communication.

Chemotherapy for varicella-zoster infections

SIR,—We would like to add our experience of using adenine arabinoside (ara-A) in herpes simplex and herpes zoster infections to those commented on in your leading article (18 December, p 1466). Juel-Jensen¹ reported a good clinical response in two out of three cases with herpes zoster infections.

During the past two years we have treated seven patients with this drug administered by intravenous infusion in a dose of 10 mg/kg/day over a five-day period.² All of these patients were suffering from some form of malignant disease and four were receiving cytotoxic chemotherapy when they developed their infections. Five developed disseminated zoster, two of whom had panencephalitis. Two further patients had herpes simplex infections, one with severe ophthalmitis. In all cases the diagnosis was confirmed virologically by direct electron microscopy of vesicle fluid and by virus isolation. Latterly indirect immunofluorescence techniques have been used to demonstrate herpes simplex or varicella-zoster antigen in cells from the base of the patient's lesion. A response was defined as the arrest of progressive disease with no new lesions and resolution of fever.

Four of the five patients with herpes zoster, including one of those with panencephalitis, responded to treatment. The fifth patient, with progressive disease on treatment, failed to respond even when the dose of ara-A was doubled to 20 mg/kg/day. Of the two patients with herpes simplex, the one with ophthalmitis responded, while the other, with multiple facial lesions, failed to respond.

Myelosuppression occurred in three of these patients and four became drowsy during the infusion of ara-A. Gastrointestinal disturbance was minimal. Severe neuralgia occurred in two patients with herpes zoster and ara-A failed to relieve these symptoms.

Our experience with ara-A lends support to the findings of other workers that, although effective in preventing dissemination of disease

in the majority of patients, it fails to relieve neuralgia in herpes zoster.

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¹ Juel-Jensen, B, *Journal of Antimicrobial Chemotherapy*, 1976, **2**, 261.

² Keeney, R E, and Buchanan, R A, *Annals of the New York Academy of Sciences*, 1975, **255**, 185.

³ Johnson, M T, Luby, J P, and Buchanan, R A, *Journal of Infectious Diseases*, 1975, **131**, 225.

Low-dose progestogens and ectopic pregnancy

SIR,—We were most interested in the communication from Drs P Liukko and R Erkkola (20 November, p 1257) on the relative risk of ectopic pregnancy with the different progestogens (D-norgestrel, norethisterone, and lynoestrenol). Although structurally similar progestogens have varying effects on the female reproductive tract, the observed difference in the incidence of ectopic pregnancy for these three closely related 19-norsteroids seems particularly marked and far more pronounced than their relative contraceptive efficiency as indicated by the Pearl index quoted by these authors.

We should like to inquire if all three groups in this study were comparable for characteristics that influence the risk of pregnancy with continuous low-dose progestogens and for factors that might favour the development of an ectopic pregnancy. For example, was the form of hormone administration similar in all three groups—that is, were the tablets given in bottles or day-marked packs? In this context it is interesting to note that for tablets given in bottles it has been found that only 40% of patients follow this form of regimen conscientiously.¹ Were all members of the study of the same ethnic group and comparable in stature and weight? In relation to such considerations it has been observed² that effective contraception was achieved in Mexican women by a smaller dose of hormones administered on the sequential regimen than was needed for the larger British female patient. Equally important, were all the women of comparable age, married, and able to have unrestricted intercourse? Were they of proved fertility, having previously conceived with ease or was there any possibility of subfertility from a previous history of appendicitis, pelvic infection, or pelvic operations, factors which might not only prevent conception but favour ectopic pregnancy if conception did occur?

If this marked difference in the risk of ectopic pregnancy is valid then it indicates an impressive disparity of action between three closely related progestogens. It implies either (a) that lynoestrenol has a particularly efficient action on the cervical mucus, largely preventing any form of conception occurring, whereas norgestrel and norethisterone achieve their contraceptive effect principally by acting on the endometrium, thereby preventing intrauterine but not extrauterine pregnancy, or (b) that norgestrel and norethisterone, but not lynoestrenol, significantly affect tubal function and delay the passage of the fertilised ovum through the fallopian tube, thus favouring tubal or even ovarian³ implantation. Such

progestogenic influence on tubal function, however, has been rejected as cause of ectopic gestation.⁴

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- ¹ Martinez-Manautou, J, *Syntex Symposia Series No 2*, p 18. Amsterdam, Excerpta Medica, 1968.
² Butler, C, and Hill, H, *Lancet*, 1969, **1**, 1262.
³ Huntington, K M, *Lancet*, 1974, **1**, 360.
⁴ Hawkins, D F, *British Medical Journal*, 1974, **1**, 387.

* * * We sent a copy of this letter to Drs Liukko and Erkkola, whose reply is printed below.—Ed, *BMJ*.

SIR,—In response to the comments of Drs Corcoran and Rizk we wish to add that: (1) only day-marked packs of birth control pills are available in Finland, (2) all mothers were of same ethnic group, (3) the weight of the women varied from 47 to 65 kg, with no statistically significant difference between the groups, (4) their ages varied from 19 to 34 years, (5) all but one had previously delivered a child, and (6) no differences in terms of previous operations or infections were noted.

In analysing the possible reasons for the low rate of ectopic pregnancy with lynoestrenol Drs Corcoran and Rizk omit the one which we consider the most important. It has not been demonstrated that 0.5 mg of lynoestrenol is equivalent in terms of progestational activity to 0.03 mg of D-norgestrel or 0.3 mg of norethisterone. In fact, there is some evidence that the ovarian effect of 0.5 mg of lynoestrenol is profound, with either inhibition of ovulation or effective functional suppression of the corpus luteum.¹⁻⁴ This would also explain the low Pearl index with 0.5 mg of lynoestrenol.

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- ¹ Wiese, J, *Acta Endocrinologica*, 1975, **78**, 325.
² Gerber, E, Koch, Ph, *Medizinische Klinik*, 1976, **71**, 51.
³ Aktories, K, et al, *Geburtshilfe und Frauenheilkunde*, 1976, **36**, 318.
⁴ Friedrich, E, et al, *American Journal of Obstetrics and Gynecology*, 1975, **122**, 642.

SI: two years on

SIR,—I am writing to state how strongly I agree with the views expressed by Professor D N S Kerr (15 January, p 167). This is in spite of the fact that I have somewhat reluctantly, and on the recommendations of the Department of Health and Social Security, allowed SI units to be introduced into the reporting system of our hospital routine biochemistry laboratory.

Clinical diagnostic ability frequently makes use of a "gestalt" mechanism in which an overall pattern is recognised. This includes the history, clinical signs and symptoms, and the results of various methods of investigation, including biochemical. Excellence in clinical medicine is acquired only after a long period of experience. By the time such excellence has been acquired an individual can be expected to be somewhere between 40 and 60 years of age. This is a time when it is extraordinarily difficult to grasp drastic changes, such as SI units, which therefore interfere with the accustomed overall pattern giving rise to

diagnosis, especially in the emergency situation. As doctors we should realise that although wisdom may increase with age, on the whole adaptability decreases.

I have some sympathy with Dr M J Conway's concept (22 January, p 229) that so-called normal values should be expressed as 100 and that laboratory results should be expressed in appropriate figures related to standard deviation. I am afraid, however, that this is not acceptable in the light of what we know about variation in biochemical findings with age, sex, time of day, social class, time of the year, method of collection of the specimen, etc. We are not yet at a stage when we can separate out these variations and there could well be catastrophic mistakes in interpretation of virtually all biochemical data, not only in relation to just some. May I mention, as examples, variations of serum alkaline phosphatase and of serum cholesterol with age? The latter has led to much confusion in relation to ischaemic heart disease.

I largely agree with the suggestion put forward by Dr M B King in the same issue (p 229) but would again suggest, for the reasons given above, that it would be impossible to provide normal ranges of values. I am not splitting hairs, therefore, when I suggest that the values supplied should be the so-called reference ranges for the laboratory, since the concept of normality is so complicated.

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Leprosy in Northern Nigeria

SIR,—Dr C L Crawford (25 December, p 1562) criticises me and, by implication, the Faculty of Medicine of Ahmadu Bello University, Zaria, for sending medical students to a leprosarium to learn about leprosy.

Whatever is the prevalence and, even more important, the incidence of leprosy in the north of Nigeria today, it remains an important disease. Leprosy has a remarkably wide spectrum of clinical features, and medical students should have seen as many of these as possible, especially if the disease is to be dealt with in general dispensaries, clinics, and hospitals. The place to become familiar with the natural history of leprosy, with its manifold manifestations and with the difficulties of making a clinical diagnosis, is a leprosarium where good records are kept and large numbers of outpatients seen. It is desirable, too, that the student should be able to reach a definitive diagnosis himself by making, staining, and examining slit-skin smears. This also can be learnt under supervision in a well-equipped leprosarium.

The management of the established case of leprosy involves a good deal more than regular administration of dapsone, and students can see for themselves the wide range of therapeutic measures available in a good leprosarium (physiotherapy, occupational therapy, surgery, physical, psychological, and social rehabilitation, etc.). If an attachment to a leprosarium enables students also to see a wide variety of skin disorders, to visit villages where over half the inhabitants have onchocerciasis, and to see for themselves the conditions in which this infection is common, as well as to familiarise themselves with the ecology of a part of the

vast Federation of Nigeria which they might otherwise never know about, then their visit to the leprosarium at Garkida should be a rewarding and relevant experience.

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Hepatitis B in general practice

SIR,—During the two-year period 1975-6 tests from HBsAg (hepatitis B surface antigen) were carried out on sera from 753 patients in Ayrshire, of whom 583 (77%) were in hospital and 170 (23%) from general practice. Despite their lower proportion HBsAg was detected in 19 (11%) of the 170 general practice patients but in only 5 (0.9%) of the 583 hospital patients.

Most of the hepatitis B patients from general practice had mild illnesses and did not require admission to hospital. It seems that a code of practice similar to that for hospital patients positive for HBsAg¹ is required for the treatment and management of cases at home.

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¹ Department of Health and Social Security, *Report of the Advisory Group on Hepatitis and the Treatment of Chronic Renal Failure 1970-2*. London, DHSS, 1972.

² Lowbury, E J L, et al, *Control of Hospital Infection*. London, Chapman and Hall, 1975.

Blood: breath partition coefficient of alcohol

SIR,—According to Henry's Law a major factor affecting the calculation of blood alcohol concentration using the partition coefficient will be temperature. Wright¹ estimated that a 1°C rise in temperature will increase the estimated blood alcohol concentration by 6.5%. It would be interesting to know how Dr T A A Alobaidi and his colleagues (18 December, p 1479) controlled mouth temperature during their experiments. This is a possible explanation for the poor correlation observed between actual and calculated blood alcohol concentrations.

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¹ Wright, B M, in *Proceedings of the Third International Conference on Alcohol and Road Traffic*, p 251. London, British Medical Association, 1963.

* * * Dr Alobaidi having returned to Iraq we sent a copy of this letter to Professor J P Payne, whose reply on behalf of all three authors of the paper referred to is printed below.—Ed, *BMJ*.

SIR,—Dr Slater is of course correct in his assertion that the partition coefficient is a function of temperature. In our experiments we made no attempt to control mouth temperature for obvious reasons, but we measured it and made the appropriate correction in our calculations. To save space and because they had been published previously we did not include the details in the text but we did provide the references to our previous work.^{1 2}