though in form participles, are in fact nouns, many people who commit the error of using fused participles would not do so if they were using pronouns rather than proper names or titles for the people concerned. Indeed Dr Bradshaw used the gerund correctly when he hoped that "you will put your editorial heads together and so avoid . . . their being banged together later."

It should be noted that where the two editors are concerned compound possessives are required, since the possessive must immediately precede the gerund—that is, "the possibility of the editor of *World Medicine's* having delusions of grandeur and that of the editor of the *British Medical Journal's* ignoring conventions. . . ." When this construction becomes awkward (usually because of the excessive length of the compound possessive) the construction should be changed, since the possessive case *must* be retained with a gerund.

I now await with interest the exposure of my own solecisms.

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¹ Fowler, H W, *A Dictionary of Modern English Usage*, 2nd edn, revised E Gowers, reprinted with corrections, p 215. London, Oxford University Press, 1970.

Insulin U40, U80, or U100?

SIR,—I am sure that everybody agrees with Dr Joanna Sheldon and her colleagues (27 November, p 1319) that the present system is rather confusing when insulin of different strengths is administered with a syringe whose graduation was devised at a time when insulin was available only in a strength of 20 U/ml. I also agree that it is an excellent idea to use only one strength of insulin with a syringe which is graduated accordingly.

However, if this cannot be arranged in the very near future, I believe that the second best remedy would be to cease forthwith manufacturing these completely outdated "insulin syringes" and to supply diabetics with syringes which are graduated in millilitres, since it is much less confusing to tell a patient who, for example, uses insulin U40 to inject "20 units, which is $\frac{1}{2}$ ml" than to tell him to inject "20 units which is 10 units" (on the syringe).

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Percutaneous transhepatic cholangiography

SIR,—We write in support of Dr G M Fraser and his colleagues from Edinburgh (27 November, p 1321). Like them we feel that Dr Iain M Murray-Lyon and Mr Keith Reynolds (16 October, p 923) overstress the complications associated with the Chiba needle. A similar point of view has been put forward in another recent review from the Royal Free Hospital¹ suggesting that the complication rate is not significantly different from that for the older sheathed needle technique.

We have performed slim-needle percutaneous cholangiography on 45 consecutive patients with a clinical diagnosis of obstructive jaundice. In 44 the biliary ducts were outlined, including six patients with intrahepatic cholestasis and undilated ducts. No serious complications were encountered and cholangitis was not seen. Laparotomy was delayed for one

to seven days in those patients with extrahepatic obstruction and only one was found to have developed a biliary leak, which may have resulted from a fistulous communication between a carcinoma of the gall bladder and the colon.

We now feel that this technique is the procedure of choice in patients thought to have extrahepatic obstruction and has, in our unit, replaced endoscopic retrograde cholangiography.

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¹ Elias, E, *Gut*, 1976, 17, 801.

Ultrasonic measurement of liver size

SIR,—Dr S Sullivan and his colleagues (30 October, p 1042) have drawn attention to the inaccuracies in clinical estimation of liver size. They conclude that more reliable methods should be used in studies in which liver size is of diagnostic, prognostic, or therapeutic importance. They draw particular attention to the problem of assessing the level of the upper border of the liver. We have compared this level as obtained clinically by percussion (two observers) to that found from an immediate longitudinal ultrasonic B-scan in the mid-clavicular line. The level assessed clinically in 11 healthy subjects was between 2 and 6 cm lower than that obtained by ultrasound (see figure). Thus change in percussion note, usually taken as the level of upper border of the liver, is consistently lower than the true level.

Longitudinal ultrasonic B-scan in the midclavicular line. A—clinically determined level of upper border of liver; B—ultrasonically determined level.

Ultrasound provides a safe, non-invasive method for measuring liver size.¹ Although transverse ultrasonic B-scanning can outline the liver in its lower part, the upper dome is obscured by overlying echogenic lung tissue. We have overcome this problem by using a combination of transverse and longitudinal scans. With the patient supine and breathing quietly serial transverse scans at 1-cm intervals are recorded from the inferior limit of the liver of the upper limit at which liver can be outlined. Serial longitudinal scans in the sagittal plane delineate the liver edge above this level. All scans are photographed and the

liver outline transcribed on paper. The whole areas of liver on the transverse scans and the appropriate areas on the longitudinal scans are measured using a computer fitted with a graphic tracing device. Liver volume is derived as the sum of all areas measured multiplied by the magnification factor used. This method has proved useful for clinical research.² It yields reproducible results (coefficient of variation 6%). In 20 normal subjects the liver volumes obtained correlated with body weight ($r + 0.81$) and were consistent with allometric predictions of liver volume. In two patients who died within a week of ultrasound estimation the values obtained differed by less than 1% from post-mortem liver volumes.

We are indebted to Dr F Ross and Dr R Wells for use of equipment and facilities.

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¹ Rasmussen, S N, *British Journal of Radiology*, 1972, 45, 579.

² Roberts, C J C, et al, *British Journal of Clinical Pharmacology*, 1976, 3, 907.

Road safety: BMA comments

SIR,—The publication of the BMA's comments on the Government's consultative document dealing with road safety (23 October, p 1000) is of considerable interest. It emphasises that road accidents are a major cause of permanent disability and one therefore in which the medical profession should have a preventive role.

There are two interlinked factors which bear consideration. The first relates to speed limits. At the present time there is much debate as to whether these should be increased, since they have had little effect in terms of fuel saving. This discussion continues about raising the limits in spite of the clear evidence from the United States that both mortality and morbidity have been considerably reduced as a result of speed restrictions that were enforced in order to conserve energy reserves. Secondly, the higher the speed, the greater is the chance that head injury as a result of an accident will be severe and the likelihood of subsequent epilepsy increased. Indeed, Caveness¹ puts forward the view that road traffic accidents in the USA are the main cause of acquired epilepsy in adults. For this reason it is important that any pressure on the Government by motoring organisations to increase speed limits should be tempered by the knowledge that such an increase will not only lead to greater mortality but also to morbidity of many kinds, including epilepsy.

Clearly environmental factors such as road surfaces, weather conditions, and the state of the vehicle influence the incidence of accidents and obviously affect mortality and morbidity. These in their turn involve the Health Service in monetary cost for medical treatment. In spite of this there is no way of assessing the amount of grief and suffering caused to families as a result of these often serious mishaps. For all these reasons the suggestion in the BMA's comments that some funds be