apple-eating and seldom lasted for more than one minute. No other food provoked these symptoms, which also occurred when the peel was removed or eaten separately and when only a small piece of apple was eaten. Cooked apples produced no reaction whatsoever. The symptoms could be reduced slightly by drinking a glass of cold water immediately after swallowing the apple. Physical examination was completely normal. His brother, who was also a doctor, gave a very similar history, but in his case the symptoms were much less severe. Both of them also suffered from hay fever and had learned to avoid apples altogether.

Because of a possible cardiac effect³ electrocardiography was performed during apple ingestion. Both the resting trace and the trace during swallowing and the following 3 minutes showed no abnormality and the pulse and blood pressure (erect and supine) remained normal throughout despite the presence of his usual symptoms.

The aetiology of this patient's symptoms remains obscure. The rapidity with which the symptoms develop after ingestion, their brief duration, their alleviation by drinking water, and the absence of cardiac effects suggest that a local mechanical or chemical effect of the apple pieces on the oesophagus may be responsible. It is interesting that both he and his brother have a history of atopy, and the lack of effect of cooked apples perhaps indicates the role of a heat-labile antigen.

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¹ Mackarness, G R G, *British Medical Journal*, 1973, **1**, 114.

² Johnstone, I L, *British Medical Journal*, 1972, **4**, 613.

³ Havland, T, and Frithz, G, *British Medical Journal*, 1976, **2**, 643.

Educational needs of handicapped children

SIR,—Never before have the problems and needs of the physically handicapped been publicised so much as they are now, from the highest governmental echelons to the grass roots of local voluntary bodies. You are therefore to be commended on following this desirable trend in your issue of 4 November by publishing the touching article by Margaret Blackwood (p 1292) and your leading article on the educational needs of handicapped children (p 1245). Your editorial concludes with a pointed and poignant reference to current financial stringencies impeding the recommendations arrived at after lengthy deliberations by experts.

The problem of educating physically handicapped children becomes the concern of doctors because many of these children are on drugs—anticonvulsants, sedatives, etc—or have disabilities—the incontinence of spina bifida children or the ataxia of the cerebral palsied. Many of these unfortunate children have severe multiple handicaps and require individual assessment and attention by their teacher. I feel there is insufficient liaison between the prescribing doctor and the teacher responsible. I do not believe that this individual care can be given when attempts are made to integrate the children into ordinary schools or even in the few specialised schools that exist for the physically handicapped. As you point out, research studies have indicated that a high teacher:pupil ratio is required—sometimes as high as 1:2. How can the country afford all this?

I think that an answer can be found by

setting up small tutorial units for these children in groups of about six. Special schools would not be required since local authority clinics, which are already structurally adapted for mothers with prams or for wheelchairs and are mostly built on one level, could be used. Nearly all the clinics I know are not fully utilised during the day. There is no shortage of teachers or voluntary helpers to assist these children not only in conventional school subjects but also in occupational therapy, speech therapy, simple games, etc.

Health centres owned and run by group practices could play an important and even pioneering role here. It could even be a useful augmentation of the practice income if rental could be obtained from the local authority or even from parents if the organisation can be run on private lines. I would here draw attention to the fact that local authorities have a statutory obligation to provide for the education of the physically handicapped child and I have known certain education authorities pay up to £600 per term when they cannot provide proper facilities for this themselves.

If we are to help the physically handicapped to play a useful and independent role in society and not become permanent charges on public funds for the rest of their lives it is imperative to start early and this means providing a proper and tailored education for these children, who so often display a courage and cheerfulness that put our moans and grumbles to shame.

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Link between hepatoma and hepatitis B

SIR,—We would like to correct an error made in your leading article on this subject (9 September, p 718).

The statement is made there that "in a recent retrospective pathological study of hepatoma from California fewer than 1% of non-cirrhotic patients with hepatoma had markers of hepatitis B virus infection, whereas 73% of patients with cirrhosis had HBs antigenaemia." Reference was made to a paper from our liver unit.¹ The 73% figure was clearly stated in our paper to be the frequency of identification of HBsAg in the serum of patients with hepatocellular carcinoma (HCC) arising in *non-alcoholic* but cirrhotic livers. The decision to separate the patients with HCC in non-alcoholic cirrhosis from those with HCC in alcoholic cirrhosis seemed reasonable when, after immunoperoxidase staining of the liver of 168 patients with HCC dying between 1949 and 1970, an inverse relationship was found between racial groups with a high occurrence of HCC in alcoholic cirrhosis (Caucasians and Mexicans) and racial groups with a high frequency of occurrence of HCC in B-viral cirrhosis (Orientals and Negroes). Thus since 1969, when serum studies became available, alcoholic cirrhotics with HCC have been studied separately from patients with HCC in B-viral cirrhosis.^{2,3}

It is of less importance that the editorial also errs when quoting our incidence of HBsAg with HCC in normal livers to be less than 1% instead of the 5% stated in our paper.

At our centre the most common liver disease underlying HCC is still alcoholic cirrhosis. However, when comparing the coincidence of HCC and B-viral disease with that of countries in which alcoholic cirrhosis is nearly non-existent it seems only

appropriate to use only HCC in *non-alcoholic* cirrhosis as the denominator.

In your leading article you further state that "such a difference has not been found in major series from Britain and the United States." You then give reference to one study of frequency of HBsAg in HCC in Vietnamese⁴ and to a second article "in press." We are unaware of any other large study in which comparison of HBsAg in HCC patients from the United States, Britain, or Western Europe was made with HCC patients from Asian and African countries after exclusion of the alcoholic cirrhotic. Since our patients were predominantly from the indigent population, study of a different socioeconomic group might result in a different coincidence. The table would indicate that the racial differences in relationship of HCC to HBsAg are reduced after exclusion of the alcoholic. It is likely that the two racial groups with the highest alcoholic rates (Mexican and Caucasian) still include some alcoholic cirrhotic patients who steadfastly denied alcoholism and whose cirrhosis was not identifiable as alcoholic type.

Frequency of HBsAg positivity in hepatocellular carcinoma arising in non-alcoholic chronic liver disease in adults, California, USA

Race	No of patients	Positive for HBsAg (%)
Oriental ..	19	89
Negro ..	15	80
Caucasian ..	14	78
Mexican ..	14	57
Total	62	77

The fact that the frequency of finding HBs-antigenaemia in patients with HCC arising in *non-alcoholic* cirrhosis in the USA is similar to that in the Orient and in Africa suggests that if there is a cocarcinogenic factor it must be one common to or of similar potency in widely disparate geographical, agricultural, and cultural regions. It seems more likely that differences in frequency of occurrence of hepatocellular carcinoma in various geographical areas is related to differences in the incidence of chronic B-viral disease and perhaps the time in life at which hepatitis B virus was acquired.

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¹ Peters, R L, Afroudakis, A P, and Tatter, D, *American Journal of Clinical Pathology*, 1977, **68**, 1.

² Peters, R L, in *Hepatocellular Carcinoma*, ed K Okuda and R L Peters, ch 8. New York, Wiley, 1976.

³ Omata, M, et al, *Gastroenterology*. In press.

⁴ Welsh, J D, et al, *Gastroenterology*, 1976, **70**, 392.

Failure of mecillinam and pivmecillinam to eradicate convalescent carriage of salmonellas

SIR,—The apparent efficacy of pivmecillinam¹ in curtailing chronic salmonella carriage^{1,2} has prompted us to assess the usefulness of this drug and that of mecillinam in a group of convalescent faecal excretors of non-typhoid salmonellas. We gave both drugs by mouth.

Eighteen patients aged between 21 and 95 years (mean 69 years) received a total of 22 14-day courses of treatment under inpatient supervision. Known duration of excretion