clinic for investigation of secondary infertility and had given a six month history of oligomenorrhoea and galactorrhoea. Her serum prolactin concentration had then been 1820 mU/l (normal ≤360 mU/l), and radiographs of the pituitary fossa had shown nothing abnormal. Thyroid function tests had not been performed. The patient had been treated with conventional doses of bromocriptine for four months and the galactorrhoea had stopped, the prolactin concentration falling to 140 mU/l. Her periods had returned to normal and she had become pregnant and given birth to a normal child in 1982. After a nursing period of about five months intermittent secretion of milk had persisted until the patient was seen in our clinic in 1985.

She denied significant menstrual irregularities and she was taking no medication. On examination bilateral galactorrhoea was confirmed and, apart from a slowish pulse of 66/min, she was clinically euthyroid. Serum prolactin concentration was again high at 1360 mU/l. Her serum thyroxine value was low at 16 nmol/l (1·25 μg/100 ml) with serum thyroid stimulating hormone values greater than 45 mU/l, a picture compatible with primary hypothyroidism. Thyroid microsomal autoantibodies were present at a titre of 1/3200. Computed tomography showed a large pituitary gland, probably hyperplastic, without focal abnormalities. She was treated with thyroxine 0·05 mg daily, increasing to 0·1 mg daily, and within three months her serum thyroxine, thyroid stimulating hormone, and prolactin concentrations returned to normal and the galactorrhoea stopped.

We concluded that this patient's hyperprolactinaemia was associated with her primary hypothyroidism and that the stimulating effect of the thyrotrophin releasing hormone on the lactotrophs had been counteracted by the prolactin inhibiting action of the dopamine agonist (bromocriptine) administered for what was thought to be idiopathic hyperprolactinaemia. The restoration of fertility after the return to normal of serum prolactin concentrations suggests that hyperprolactinaemia might play a part in the infertility commonly associated with primary hypothyroidism. Raised serum prolactin values are common in primary hypothyroidism (39% in a series of 49 patients),[1] but galactorrhoea is much less common and appears to occur mostly in women with a history of pregnancy.[1,2] In 235 patients investigated for galactorrhoea 10 had primary hypothyroidism but only five had raised prolactin values.[3] It is therefore important to assess thyroid state not only in patients with hyperprolactinaemia but in all patients with galactorrhoea, including, of course, those who are clinically euthyroid.

I am grateful to Dr J Q Matthias, for permission to report on a patient under his care.

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Neurological complications of coronary artery bypass surgery

SIR,—The six month follow up paper from Newcastle on the neurological complications of coronary artery bypass graft surgery (19 July, p 165) is reassuring only in that the high incidence of cerebral changes, seen early after surgery, proved to be largely recoverable by six months. Dr Pamela J Shaw and her colleagues are to be congratulated on their assiduous follow up. A comparable improvement has been found in our smaller group of patients followed up for two months after surgery.[1] While the six month results are comforting at first sight, detection of impaired function soon after operation has now been shown to carry serious long term implications despite apparent complete recovery.[2]

Because of the descriptive nature of the study it is difficult to use their data to improve practice. It is tempting to relate the "soft" neurological signs and neuropsychological impairment, seen in so many patients, to inadequate perfusion while on bypass but before this apparently obvious inference can be drawn information is needed about patients undergoing other types of major surgery. Our own preliminary data, including a control group,[1] show that neuropsychological changes are seen after thoracotomy and aortoiliac surgery. It would be valuable to know what Dr Shaw and her colleagues found in control cases so that the precise role of cardiopulmonary bypass and cardiac surgery can be assessed.

A relatively large number of the Newcastle patients developed peripheral nerve lesions. Although a specific mononeuritis related to bypass has been proposed,[3] it seems more likely that popliteal and ulnar nerve lesions, for example, relate to mechanical factors.[4] Brachial plexus lesions, which they also include, are a recognised complication of cardiac surgery[5,6] which may resolve and which are also encountered after thymectomy, confirming that it is the sternotomy, not the bypass, that is to blame.

The most serious complication proved to be stroke, which is generally believed to be embolic, though hypoperfusion may, of course, increase the brain's vulnerability to embolism. It would be helpful to know whether the clinical picture and computed tomography suggested that perioperative stroke was due to infarction in the watershed areas or in the territory of the branches of the middle cerebral artery.

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AUTHORS' REPLY—We agree that the five year neuropsychological outcome in patients undergoing heart valve surgery, reported by Sotaniemi *et al*,[1] is a cause for concern. The course of postoperative complications may differ in patients undergoing coronary bypass, and we intend to follow up our cohort to assess long term outcome. The assessment of the functional impact of any detectable long term disorders will also be of great interest.

We agree that before neurological and neuropsychological complications can be attributed to cardiopulmonary bypass per se it is important to evaluate the effects of major surgery without the use of extracorporeal circulation. In the Newcastle study we compared the findings in the 312 patients who underwent coronary bypass with those in a group of 50 patients undergoing major non-cardiac vascular surgery. We found a substantially lower incidence of complications in control patients than that reported by Smith *et al*,[2] and details of the study will shortly be submitted for publication.

Computed tomograms were obtained in four of the 15 patients who developed stroke in our study. In three of the four the scan appearances suggested embolic rather than watershed infarction. In all the patients with severely disabling major stroke the brunt of the damage was borne by the right hemisphere. It is possible that the right carotid artery may be more liable to embolisation, being the first major branch of the ascending aorta. Others have found that the right hemisphere is more likely to be injured during heart surgery.[3]

Our analysis of causative and predisposing factors for neurological and neuropsychological complications, including stroke, is currently in progress. As others have found, it is usually difficult to pinpoint the cause for stroke in individual patients.[4]

Though embolic events have been considered to be the major cause of stroke during heart surgery, hypoperfusion may also be a contributory factor.

Further work is needed to define patterns of cerebral blood flow during heart surgery and to define safe limits of intraoperative mean arterial pressure in various groups of patients, including the elderly and those with hypertension. Now that non-invasive methods of cerebral angiography are available it would also be useful to determine whether the presence of significant cerebrovascular disease predisposes to cerebral injury.

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Cryptosporidium and diarrhoea

SIR,—For a consultant paediatrician to encourage bacteriologists to reduce the number of times they report "stool culture negative" by looking for cryptosporidium in patients with diarrhoea is indeed a clarion call. There must be few bacteriologists worth their salt who are not already complying, at least when the clinical information encourages them to do so. Dr J G Bissenden (2 August, p 287) could have begun with abdominal pain and vomiting as major symptoms: both sometimes occur without diarrhoea, vomiting being a major presenting feature in over 40% of cases.[1]

Although some workers have reported an association with *Giardia lamblia*,[1-3] others have not confirmed this association.[4] The more common association with *Campylobacter* sp[1,5] is not mentioned.

Dr Bissenden's comparison of staining methods is invalid: the true yardstick is total handling time, not staining time.[6] He fails to mention fluorescence staining by auramine,[6,7] which is particularly reliable.[8] It may be true to say that the number of oocysts present may sometimes be small: in acute cases they are usually seen in large numbers. When

they are scanty the auramine stain undoubtedly provides the most sensitive method of finding them.

As a paediatrician it is curious that the author omits any mention of the increased incidence in children[1 9 10] or of its importance in the Third World,[11 12] where the infection carries a high mortality, or of the positive benefits of breast feeding.[11]

While he correctly draws attention to the need for hospitals looking after children and immunocompromised patients to regard the search for cryptosporidium as routine, the steady increase both in the use of immunosuppressive therapy and in the number of cases of acquired immune deficiency syndrome brings most hospitals into the fold. Examination for *Cryptosporidium* does not carry a massive cost: as a demand led service it could be said that more attention paid by clinicians to avoiding unnecessary tests would help to neutralise any financial constraints.[13] We were the first to draw attention to the fact that this simple test could avoid unnecessary invasive clinical investigations.[4] Since we began to look for cryptosporidium in this rural area three years ago its incidence here has remained at about 2%: during this period it has been a pleasure to encourage others to maintain vigilance through fallow periods when it was lying low. It has never failed to oblige our colleagues in the long run.

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Palliative care—specialty or generality?

SIR,—Dr Graham Thorpe's Personal View on the evolution of hospice medicine (9 August, p 388) raises many points. Certainly the rapid growth of hospices has improved the care of the dying in small areas but it is now widely recognised that with the United Kingdom's varied geography and demography this is not the answer to a general improvement in care.

I believe there is a serious danger in the insidious development of a new specialty of palliative medicine, which may in fact reduce the quality of care for the majority by making ordinary hospital or family doctors feel inadequate in dealing with the problems of their own patients. I saw this most clearly in the allied subspecialty of "pain relief," where anaesthetists were summoned to surgical wards to consult on the prescription of morphine to control patients' pain because the surgical staff felt that this was now a complex subject requiring specialist knowledge.

The National Society for Cancer Relief has recognised this problem, and, as Dr Thorpe has pointed out, has funded various imaginative university projects. The one in the department of medical education in the University of Dundee is aimed at producing a distance learning package for hospital and family doctors to teach the simple and straightforward principles of palliative care, which I hope will remove the mystique and reassure doctors that if they are willing they can provide the quality of care achieved in hospices for the great majority of their own patients.

The development of traditional training programmes with a "career ladder," and before long no doubt a specialist examination, surely is misconceived. Medical staffing and training for existing hospices must continue to be individualised according to the talents and training of the doctors available and interested.

The attributes required, however, remain in my experience those personal qualities of sensitivity, availability, and a willingness to provide continuity of care rather than those that can be provided by a sophisticated training scheme.

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AIDS, cotton wool spots, and cytomegalovirus retinitis

SIR,—We read with great interest the article by Professor Peter G E Kennedy and coworkers on the presence of cytomegalovirus but not human lymphotropic virus type III (HTLV-III) in retinal lesions in patients with the acquired immune deficiency syndrome (AIDS) (19 July, p 162).

From the text of their article it is evident that large amounts of cytomegalovirus RNA were found in the retina of two patients with a clinical diagnosis of cytomegalovirus retinitis for over four months. It is satisfying that there is such a good correlation between the simple technique of ophthalmoscopy and a sophisticated research procedure such as in situ hybridisation techniques with DNA probes.

In a third patient with blateral cotton wool spots they found small amounts of cytomegalovirus RNA in a few cells. This does not contradict our opinion,[1] shared by others,[2] that cotton wool spots may act as an entrance port for a cytomegalovirus infection of the eye but that they are primarily the result of microvascular damage induced by immune complex deposition. We believe, however, that the title of their paper is slightly confusing as it states that cytomegalovirus but not HTLV-III is detected in what are loosely called "retinal lesions." In fact, their data prove that cytomegalovirus is indeed responsible for clinical cytomegalovirus retinitis and that HTLV-III is absent in this and a number of other retinal manifestations in patients with AIDS. The spectrum of retinal manifestations in AIDS retinopathy[3] is, however, much broader than the retinal lesions encountered in the five patients described by these authors, and hence their study does not say anything about the possible causal role of HTLV-III in other retinal lesions.

We described a perivasculitis of the peripheral retinal vessels in children[4] and adults[1] with AIDS or the AIDS related complex and we suspected that HTLV-III might be responsible for these lesions. We performed a paracentesis in two HTLV-III seropositive patients with active perivasculitis of the retinal vessels and isolated infectious HTLV-III from aqueous humour in both patients.[5] A third patient had intense perivasculitis of the retinal vessels in one eye. Viral cultures were done on a peripheral blood sample, on spinal fluid, and on aqueous humour. HTLV-III was recovered from aqueous humour after nine days, from cerebrospinal fluid after 20 days, but from peripheral blood after one month's culture, strongly implying that the active inflammation of the peripheral retinal vessels was related to the presence of HTLV-III. We believe that these findings give an affirmative answer to the question raised by Professor Kennedy and his coworkers whether HTLV-III is present at an earlier stage of the ophthalmic disease.

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Hazards of bronchoscopy

SIR,—Dr Ian W B Grant's leading article (2 August, p 286) rightly draws attention to the potential hazards of fibreoptic bronchoscopy. We wish to add the following comments from our own experience of around 5000 examinations over eight years.

The incidence of moderate haemorrhage may be considerably reduced by the application of adrenaline to the area to be biopsied. It is also advisable to take special care in taking biopsy specimens when one or other main bronchus is occluded and when asphyxiation due to occlusion of the remaining major bronchus is possible. If these few patients are excluded it is possible to control quite substantial haemorrhage by continued aspiration to keep at least one lung well ventilated. The calibre of the aspiration channel is not in our experience a limiting factor; the obscuration of vision is a nuisance but with practice the tip of the bronchoscope can usually be kept clear, and if this is not possible the instrument may be removed and reinserted rapidly. Nevertheless, we would agree that the risks of haemorrhage must be greater if the facility or skill necessary for rigid bronchoscopy, and occasionally thoracotomy, are not available for occasional use.

With regard to transbronchial biopsy for diffuse lung diseases, we regard facilities for fluoroscopy as desirable rather than mandatory. If a biopsy is taken some way short of the limit of travel of the forceps tip, a technique easily acquired with a little practice, pneumothorax cannot occur.

With regard to fibreoptic bronchoscopy in