"a glorious gift of God," but is it not seemingly in age that it should be so? A wise old bachelor physician, whose clerk I had once been, said to me—still young—how good it was at last to be free of the pesterings of sex. May not even Dr Comfort live to say the same?

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Still dissolving discs?

SIR,—Do the young men still read the *BMJ* (apart from job advertisements)? If so, what will they make of the conclusion to this otherwise interesting leading article (29 October, p 1107)? "At present, therefore, there seems to be a genuine choice for the patient with classical disc herniation. Chemonucleolysis is quicker but operation surer and the relative safety arguable."

Will they doubt their senses when they see 95% of our patients recovering with rest and exercises at the proper time, perhaps with a little traction and with complete safety?

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Bumetanide in acute renal failure

SIR,—Though bumetanide has been in widespread use over recent years as an oral diuretic, there is little information on its intravenous use at high dosage and none on its use in the treatment of acute renal failure. The following somewhat unusual case report may therefore be of interest.

A 78-year-old man was admitted with a 4-h history of central chest pain and collapse. An electrocardiogram showed inferior myocardial infarction and this was associated with cardiogenic shock, aortic thrombosis—absent right femoral and diminished left femoral pulse—and acute renal failure.

His serum sodium concentration was normal. His serum potassium concentration at one stage was 7 mmol (mEq)/l, though this became normal subsequently. His blood urea level was normal on admission, but gradually rose to 75 mmol/l (452 mg/100 ml) 12 h before death. The serum aspartate transaminase and hydroxybutyrate dehydrogenase activities were typically elevated. Chest x-ray revealed pulmonary oedema and marked left ventricular hypertrophy.

He was initially given frusemide 120 mg intravenously, but remained anuric. He was then given bumetanide 6.25 mg intravenously every 4 h by constant infusion pump over 40-min periods. This regimen was continued for 113 h, during which he was given 176.8 mg of bumetanide (representing 37 mg/24 h). During this period he improved clinically and produced no less than 8035 ml of urine. Because no further supply of bumetanide was available the patient was switched to intravenous frusemide. His condition deteriorated and he died. He was given 1000 mg of frusemide over 25 h over the last hours of life, producing 1500 ml of urine.

The most interesting feature of this case is that at necropsy almost total antemortem arterial thrombosis was demonstrated. In particular, the renal arteries were nearly totally occluded and the renal tissue contained multiple large infarcts.

For renal failure to occur virtually the entire nephron population of both kidneys must be deprived of blood supply.¹ Never-

theless, that bumetanide was able to produce a diuresis of over 8 l in the presence of such widespread thrombosis of the renal vasculature is surprising.

Our experience indicates that bumetanide is an effective alternative to frusemide in the seriously ill patient with acute renal failure.

We thank Dr T Low-Beer, Selly Oak Hospital, Birmingham, for allowing us to report this case.

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¹ Bricker, N S, in *Cecil-Loeb Textbook of Medicine*, ed P B Beeson and W McDermott, p 1162. Philadelphia, Saunders, 1971.

Shortage of radiologists

SIR,—I read with great interest the letter from Dr J L G Thomson (5 November, p 1225). I could not agree more with him that the shortage of radiologists has been a big problem, and perhaps the real volume of the problem will be known in the near future after the new contract has been negotiated. Compared with many other district general hospitals, I have no doubt that Frenchay Hospital is far better equipped, and if he is finding difficulty in getting the consultant jobs filled in his centre I wonder what chances there are for departments which are not so well equipped. If in Bristol, where there is an established, well-known teaching centre for radiology, there is such difficulty that two out of four consultant jobs are vacant the situation elsewhere can well be imagined without my having to elucidate this point.

There are two main reasons why there is a shortage of radiologists. In the first instance the job satisfaction is not always present in all departments; and in the second the financial return is going to be gradually less and less, compared with our clinical colleagues, when the new contract is negotiated. I think I am voicing the opinion of many of my colleagues in radiology that promises have been made to many of us in regard to improvisation or creation of a new x-ray department altogether for several years, and nothing has happened in many instances. It is not unlikely that some of my colleagues will retire with the dream of their hearts unfulfilled, having toiled under difficult and demanding circumstances. After the successful negotiations of our junior medical colleagues those who happen to be in clinical medicine or surgery can earn substantially more than those who have chosen radiology as their future career. All of us know what an absurd and chaotic situation has been created by a senior registrar in clinical subjects being in a position to earn more money than a newly appointed consultant. Our junior colleagues are far more realistic than most of us in the older generation group, and that accounts for the increasingly lesser number of people taking up radiology as a career, where the monetary return is less likely to be as large as in clinical specialties.

It is a well-known fact that in EEC countries and also in North America and, lately, in the Middle Eastern countries radiologists are in a position to earn substantially more than they

can earn in Britain. There has been a steady drain of radiologists trained fully to take up consultant positions at the cost of the rate-payers of this country; this is inevitable, and unless something is done to counterbalance this situation the brain-drain, I fear, cannot be stopped. No matter how much we may talk about the morality of the practice of medicine, the realities of the present day have to be faced. In these days of inflation and rising cost of living radiologists cannot forget that they also have their financial commitments which they have to live up to. When they find that they are not in a position to cope with the situation or they can do substantially better by crossing the English Channel or the Atlantic I do not think that they can be blamed if they emigrate.

I have full confidence in the negotiators of the BMA, but I must say that I am a bit disappointed that, when a lot of commotion was created over the phasing out of pay-beds and private practice in hospitals and a lot of talks are still going on in regard to free time, the same degree of importance or emphasis does not seem to have been given to the short-supply specialties like radiology. It will be a very sad situation if the negotiators come to achieve a satisfactory contract with the Government but are faced with a National Health Service from which the radiologists have drained out because their interests had not been looked into in the manner in which they deserve.

It is needless to say that radiology of today is not exactly what radiology used to be 10 or 15 years ago. Radiologists today are clinicians who use their radiological knowledge in making a diagnosis to assist their clinical colleagues in the management of their cases. I would very strongly feel that one method of keeping radiologists in the country would be the introduction of an inducement bonus to compensate for the impossibility of establishing in private practice on account of the enormous costs involved and also for the limited number of domiciliary consultations.

In conclusion, I would like to say that if our clinical colleagues would like to take full advantage of modern radiology and if patient care is the primary concern of the Government, then adequate steps must be taken so that the emigration of the radiologists from this country is not only stopped but reversed.

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Functional budgeting

SIR,—I write with reference to the Association's statement on functional budgeting (12 November, p 1299). As treasurer to a large London teaching district I am both puzzled and concerned by the assertion that under functional budgeting procedures in many instances the budget holder for medical and paramedical services is other than the relevant consultant/head of department. Unsatisfactory though this arrangement is, it is surely unpardonable if it has been countenanced without reference to the appropriate consultant, etc. Such an arrangement is, in my judgment, alien to the spirit and the letter of functional budgeting.

Before reorganisation budgets in the main in the Health Service were input-orientated. In