impressions, however skilled and experienced the observer, cannot answer the sort of questions posed by Dr. Davies. Spirometry provides the only proven tests that have been used on a large scale for measuring changes in respiratory function over a prolonged period. In common with other research groups we are now using tests which have been suggested as possibly more appropriate for the study of diseases of the small airways, but the results will not be available for some time. Dr. Davies restates the interesting hypothesis that chronic bronchitis may protect men from developing pneumoconiosis. He cites recent work showing that relatively large particles ($> 3 \mu\text{m}$) have a reduced probability of reaching the alveoli. Effects on smaller particles which form the bulk of the dust in miners' lungs (mostly $1 \mu\text{m}$ diameter) are unknown. These speculative ideas are being kept under review and may help to explain future findings, but they cannot be used as serious evidence at present.

Neither the medical service of the National Coal Board nor the Institute of Occupational Medicine is responsible for the administration and operation of the compensation machinery. These are managed by the Department of Health and Social Security. Our function is to engage in research on diseases of coalminers and to publish the facts. This we have done and will continue to do.—We are, etc.,

J. S. McLINTOCK

National Coal Board,
London

D. C. F. MUIR
M. JACOBSEN
W. H. WALTON

Institute of Occupational Medicine,
Edinburgh

- 1 Rogan, J. M., et al., *British Medical Journal*, 1961, 1, 1337.
- 2 Ashford, J. R., et al., *American Review of Respiratory Diseases*, 1970, 102, 370.
- 3 Rae, S., Walker, D. D., and Attfield, M. D., in *Inhaled Particles III*, ed. W. H. Walton. Old Woking, Unwin, 1971.
- 4 Rogan, J. M., et al., *British Journal of Industrial Medicine*, 1973, 30, 217.
- 5 Jacobsen, M., et al., *Nature*, 1970, 227, 445.
- 6 Cochrane, A. L., *British Medical Journal*, 1973, 2, 532.

Hepatitis and Phenothiazines

SIR,—Dystonic reactions to phenothiazine drugs are well known. It does not seem to be appreciated, however, that patients with acute liver disease may be particularly at risk.

A 19-year-old girl developed headache and vomiting while on holiday, and as she did not improve with symptomatic treatment her parents drove her back to this hospital. On arrival she was drowsy and delirious and had an alarming torticollis to the left accompanied by conjugate deviation of the eyes. Both meningitis and tetanus were considered and appropriate management instituted. The next day she was noticed to be jaundiced, and her subsequent course was typical of infectious hepatitis. She had been given perphenazine syrup for the vomiting.

A 16-year-old boy was sent to hospital with a diagnosis of tetanus because of a short history of vomiting followed by severe spasms of the muscles of the head and trunk. In addition to the spasms, which did not seem to be painful, he had some writhing movements of the limbs. Mild jaundice and bilirubinuria were noted and a diagnosis of infectious hepatitis was supported by his

subsequent uneventful recovery. He had been given prochlorperazine in normal doses.

Dr. Shaukat Mahmood Malik, of Islamabad, reported a similar case at the Silver Jubilee meeting of the Pakistan Medical Association in Karachi last year, and I suspect the patient described by Black¹ falls into the same category. These examples may not constitute proof of an association, but the severity of the dystonic reaction after small doses of phenothiazines was striking.—I am, etc.,

A. PATON

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Birmingham

¹ Black, J. A., *Proceedings of the Royal Society of Medicine*, 1973, 66, 218.

Somnolence in Children with Acute Leukaemia

SIR,—The article by Dr. J. E. Freeman and others (1 December 1973, p. 523) and the letter from Dr. G. Pampiglione (26 January, p. 158) have prompted us to report on E.E.G. findings in relation to prophylactic craniospinal irradiation in children with acute lymphoblastic leukaemia and to the occurrence of the postirradiation syndrome. This syndrome developed in eight of 12 patients treated.

(1) In haematological remission, just before the start of radiation therapy, diffuse generalized slowing in the E.E.G. was noted in four children. In two of these patients the E.E.G. became normal during the radiation therapy, while two showed continuing abnormality. One of the latter developed central nervous system leukaemia and died three months after the end of radiation; the other had had encephalitis with E.E.G. changes two years earlier.

(2) During radiation therapy repeated E.E.G. examinations were performed. Only an occasional slight slowing of the E.E.G. was noted in three of the remaining patients.

(3) When E.E.G.s were taken during or immediately adjacent to the postirradiation syndrome (five cases) they were abnormal, showing moderate to severe diffuse generalized slowing.

(4) The E.E.G.s were normal in all 10 surviving patients at follow-up 4–28 months after a period of radiation therapy. In the patients with postirradiation syndrome normalization of the E.E.G. occurred between four weeks and three and a half months after the disappearance of the clinical signs (somnolence, etc.).

In conclusion, our experience of the frequent appearance of somnolence after prophylactic craniospinal irradiation and of concomitant E.E.G. disturbances is in line with that of Dr. Freeman and his colleagues. Unfortunately Dr. Pampiglione does not report the further development of the "patchy E.E.G. abnormality" after haematological remission and during radiotherapy. In our patients studied under these conditions no patchy E.E.G. abnormality was seen. On the other hand diffuse generalized E.E.G. abnormality occurred during the postirradiation syndrome and seems therefore to be a characteristic though non-specific sign of this.—We are, etc.,

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Confusion of Tongues

SIR,—Pace Dr. G. Davidson (20 July, p. 172), there is no error in calling the language of Northern Belgium Dutch. Dutch (*Nederlands*) is the official language of both The Netherlands and Flanders, and there is even an international treaty to this effect. It is true that many people in Flanders speak the Flemish dialect, but this differs no more from the official written language than do the dialects spoken in the various provinces of The Netherlands.

Analogously, the people of Southern Belgium speak French and not "Wallonian." Likewise, as a Scotsman (and no matter what dialect I may be capable of) I should not take it kindly if I were told that what I speak is "Scotch." As far as I am aware, what I normally speak and write is English.—I am, etc.,

WILLIAM STODDART

London S.W.1

Paying for Research

SIR,—I was very interested to read your leading article (29 June, p. 685) on paying for research and found it particularly surprising that you took so optimistic a view of the current situation.

In this university department at least the effects of the University Grants Committee's decision to curtail spending on research has led to the imposition of a maximum yearly sum per person which is an amount substantially less than that proved necessary in the past for useful research. This in its turn has brought about a contracture in the useful work going on in the laboratory and in several cases a situation which makes the continuation of ongoing research untenable.

I would be interested to know how the economic problems of the country have affected other branches of medical research. Are particular universities or departments being incapacitated more than others and at what level in each case is it necessary to make a decision to reduce expenditure? Has a particular segment of the research hierarchy been especially affected and to what extent are universities prepared to honour their commitments to researchers working for higher degrees who are made redundant? Most especially there seems to have been little confrontation of the general public on the subject of how much should be spent by the Government on medical research, and I am not convinced that your article is entirely helpful in its rather euphemistic appraisal of the current situation.—I am, etc.,

M. A. GLASBY

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Congenital Absence of Vagina

SIR,—The brevity necessary to Mr. J. R. Cobbett's interesting article, "Other Congenital Abnormalities" (29 June, p. 717), has, I fear, proved to be slightly misleading with regard to the management of congenital absence of the vagina.

Firstly, a functioning uterus is quite uncommon in patients with complete absence of the vagina. Women in whom cryptomenorrhoea is associated with partial occlusion of the vaginal lumen usually have a patent upper vaginal compartment, the

walls of which, though distended, can be advanced caudally and united to the perineum.¹ The use of a free skin graft to line a pocket newly created between the bladder and rectum may be a simple procedure but an annular construction often develops at the site of union between the graft and vaginal epithelium, which necessitates the frequent use of moulds in order to retain vaginal patency.

Secondly, in the absence of a functioning uterus Williams's vulvovaginoplasty,² a form of long perineorrhaphy, is particularly easy to perform. The operation is not only brilliantly simple in design but healing usually occurs quickly and without the troublesome formation of postoperative granulation tissue. As soon as the perineal skin is united the new pouch is immediately functional as a vagina. It does not depend for its patency upon coitus or the insertion of vaginal moulds.

Any anatomical disadvantages which may attend vulvovaginoplasty are more theoretical than practical and are perhaps quite overshadowed by the singular advantage of the operation—namely, that it may safely be performed at a time which will assist the natural sociosexual development of the teenager. Free skin graft procedures, though resulting in a normally situated vagina, are best deferred until regular coitus is expected; otherwise vaginal patency must be maintained by the regular use of dilators, instruments which sometimes serve chiefly to remind the young female of her fundamental abnormality as a woman. While accepting Mr. Cobbett's comment that the use of a free skin graft to line a newly created pocket is a simple operation, I submit that in amenorrhoeic women a vulvovaginoplasty is simpler and preferable and that in patients with a functioning uterus advancement of the vagina is probably the treatment of choice.—I am, ec.,

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¹ Jeffcoate, T. N. A., *Journal of Obstetrics and Gynaecology of the British Commonwealth*, 1969, **76**, 961.

² Williams, E. A., *Journal of Obstetrics and Gynaecology of the British Commonwealth*, 1964, **71**, 511.

Adjustment of Plasma Calcium Measurements

SIR,—Dr. R. W. Marshall and Professor B. E. C. Nordin (29 June, p. 729) appear to misunderstand the way in which we derived our adjustment of total calcium concentration for albumin concentration (15 December 1973, p. 643). It was based on the calculation of "non-albumin-bound" calcium concentration. The slope of the regression of calcium on albumin in our patients was fortuitously very close to 1.0 (centre line in figure, $\theta = 45^\circ$), so non-protein-bound calcium (mg/100 ml) was calcium (mg/100 ml) minus albumin (g/100 ml). We added 4.0 mg/100 ml to these values to adjust them to the familiar normal range for total calcium. High ionized calcium values (x in the figure) give results which are higher than they should be and low ionized calcium values (z in the figure) lower results.

It is impossible to choose an albumin concentration for the "correction" of calcium which would be appropriate for all ages and

both sexes, as Dr. E. M. Berry and his colleagues have pointed out (6 April, p. 53). The calcium-albumin nomogram in preparation by Dr. Marshall and Professor Nordin would probably best be used to calculate non-protein-bound calcium.

We proposed our adjustment simply as a screening procedure to select from the many patients with abnormal albumin concentrations those who may need further investigation of calcium homeostasis. We believe it fulfils this function.—We are, etc.,

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A. J. LITTLE
R. B. WILLIAMS
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E-rosette Inhibition Test of T-lymphocyte Sensitization

SIR,—Dr. N. R. Farid and others (30 March, p. 635) have suggested that the rosette inhibition test using antithymocyte globulin directly measures sensitization of thymus-dependent (T) lymphocytes. This assumption is based on the evidence that increased amounts of A.L.S. are necessary for spontaneous rosette inhibition during rejection of grafted kidneys in man.^{1,2} We have shown that this test does not solely detect sensitization of lymphocytes since similar changes have been noted in severely ill patients.³ Furthermore, these changes were not seen during rejection of skin grafts.⁴ We have suggested that these changes are seen during rejection of an internal organ because this is a major pathological process. Such processes have been shown to be associated with a requirement for increased amounts of A.L.G. to inhibit rosette formation.³ Therefore rejection of a grafted kidney does result in changes in this test but other factors are also involved. This is thought to account

for the over immunosuppression which resulted when this test was used routinely in the post-transplant period.²

Dr. A. Cantaluppi and others (30 March, p. 636) note that patients receiving azathioprine and prednisone do not demonstrate a correlation between the urinary electrolyte ratios and the results of the test. However, these agents are known to affect the urinary electrolyte ratios and no correlation would be expected in such patients. We found a positive correlation in burned patients who were not receiving treatment which would directly affect electrolyte excretion.³ In such patients we suggested that the results of the tests reflected intrinsic secretion of adrenal corticoids and other similar substances produced in response to stress. A dramatic change in the test correlated with a change in clinical status. We do not think that the modification of the test used by Drs. Farid and Cantaluppi, but not by Bewick *et al.*² or ourselves, significantly alters the interpretation of the test since Dr. Cantaluppi's results are similar to those of Munro *et al.*¹ and Bewick *et al.*²—We are, etc.,

HELEN M. CHAPEL
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Queen Victoria Hospital,
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¹ Munro, A., *et al.*, *British Medical Journal*, 1971, **3**, 271.

² Bewick, M., *et al.*, *British Medical Journal*, 1972, **3**, 491.

³ Chapel, H. M., and Batchelor, J. R., *British Medical Journal*, 1973, **4**, 385.

⁴ Chapel, H. M., and Batchelor, J. R., *British Medical Journal*, 1974, **2**, 636.

Lawn Mower Injuries

SIR,—“Robust footwear” (Dr. J. R. Hulme and Mr. A. R. Askew, 13 July, p. 113) if made only of leather does not give adequate protection against injuries from rotary lawn mowers. Some years ago I persuaded a friend who uses such a mower extensively to buy a pair of steel-toed shoes. In due course he showed me one of these shoes after the mower had slipped on to it. The stout leather outer toecap bore a cut going right through it to the steel beneath. Without the steel he would probably have lost some toes.—I am, etc.,

A. E. MOURANT

London E.C.1

SIR,—I would add one point to Dr. J. R. Hulme and Mr. A. R. Askew's (13 July, p. 113) interesting letter. I would feel that even wearing some form of eye protection is indicated—for example, goggles. I am appalled to see the number of eye injuries today that could be avoided.—I am, etc.,

JOHN P. MARTIN

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Effects of Hyperthermia on Bladder Cancer

SIR,—I wish to comment on the interesting paper of Mr. R. R. Hall and others (15 June, p. 593).

During the past 15 years there has been an increasing amount of experimental work on the effect of hyperthermia on cancer. A natural and critical question is whether malignant cells behave differently from normal cells under heat stress. Experimental