At present there is no published evidence demonstrating higher plasma or cerebrospinal fluid Se levels in those using a SeS₂ shampoo. However, future investigations attempting to assess the role of Se in motor neurone disease will need to take into account this iatrogenic source.

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Cost of carrying out clinical diagnostic tests

SIR,—The cost of the NHS will always tend to outstrip the funds available and it is proper to look for ways in which money can be saved or redistributed within the service to better effect. Capital costs (buildings, plant, and equipment) and staff wages and salaries swallow up a major part of the available funds and—at least at the local level—it is by manipulation of the small but flexible “revenue” moneys that distribution anomalies can be rectified and new developments fostered.

It is against this background that we take issue with Mr D J Barnard and his colleagues (3 June, p 1463). They gave an itemised breakdown of the cost of carrying out a variety of diagnostic tests in their laboratory with particular reference to a number of radioimmunoassay (RIA) tests. Because the cost of labour, maintenance, and capital depreciation is large compared with the cost of reagents in the price of a single test they conclude that the use of expensive commercial RIA “kits” rather than inexpensive “in-house” reagents is justified. They claim that the labour cost reduction more than compensates an increased reagent cost and quote a specific case (serum B₁₂ and folate) as proof.

Maybe so, but from their own figures the 23% of their total tests which were carried out using commercial kits cost them £1386, while the 77% for which they used “in-house” methods cost only £416. Had they used commercial kits throughout the reagent costs would presumably have been close to £6000—an increase of more than £4000 in revenue expenditure. If this increased expenditure produces the labour-saving effect that they claim, then they will have saved the cost—and time—of at least one whole technician—a remarkable achievement.

Unfortunately the real implication of all this is that in money terms their whole RIA operation is inefficient. Their high cost-per-test is a consequence of the small number of tests done: as the load of tests increases the labour and fixed costs-per-test decrease. A comparison with this laboratory will demonstrate this. During the same period a little over 40 000 tests were carried out. Four technicians and one principal biochemist were involved. Although not all of their time was spent on RIA tests, for the sake of simplicity full time

is assumed (this results in an overestimate of time and costs). The tests carried out were thyroid-stimulating hormone, total thyroxine, total triiodothyronine, thyroid hormone binding index, growth hormone, follicle stimulating hormone, luteinising hormone, and prolactin. The average time for one test was 14 min and the average cost of time 57.5p. The average time and cost of time to Mr Barnard and his colleagues (from their data) were 27 min and 122p. Because our laboratory area (71.25 m²) is almost identical with theirs we may assume the same yearly discounted replacement and building maintenance costs. Our Nucleonic and other equipment (an automated system) is more expensive (£30 000). Discounting over seven years (an accountancy fiction: in the NHS equipment is used until it falls to pieces) gives £4286 per annum and maintenance (7% per annum) £2100. Our cost of collection and distribution (£2500) is rather more than four times theirs. Our total cost for radio-pharmaceuticals, reagents, and consumables, rounded up, is £5000. Adding administration costs at 3.3% to our total running costs of £39 000 (£1287) gives an average total cost per sample of nearly 101p. The average total cost per sample (radioimmunoassay) to Mr Barnard and his colleagues was 318p.

Hence it is uneconomical for laboratories to carry out small numbers of those tests, which are better handled in large numbers centrally by semi-automatic processing. These comparisons underline the fact that for every laboratory to provide a full service of available tests is very expensive. Radioimmunoassay test results in particular are rarely needed urgently and there is a strong case for handling the service load in specialised units of an appropriate size.

Specialised units are in a far better position to develop and maintain their own reagents and radiopharmaceuticals. This is important because commercial kits—if used—are the one item in the cost-per-sample which does not decrease as the scale of operation increases (apart from the marginal effects of discounts for quantity). Our reagents bill would increase by more than £25 000 per annum if we were to use commercial kits and there would be no saving in labour costs. This amounts to a very substantial saving in revenue costs which can then be deployed elsewhere.

The two conflicting views—that all laboratories providing a general service should “do everything” or that certain functions are best centralised—pose a problem which those who make the policy decisions must solve. But it is clear, in the case of radioimmunoassay at least, that small numbers of samples assayed in many laboratories are much more expensive than large numbers processed in centralised laboratories. If small operators also use commercial kits (and the temptation to do so is strong) the cost to revenue funds is needlessly high.

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The continent urostomy

SIR,—I should like to support the balanced view given in your leading article (19 August, p 520) on the various techniques for appliance-free urinary diversion. Whether an ileocaecal segment or ileal pouch is used, catheterisation

of the urinary reservoir often becomes increasingly difficult and may require later conversion to a free draining conduit. Our experience over the last five years is with an ileocaecal segment,¹ which is ready made, but the ileal pouch may be preferable and worth constructing to avoid mucus problems and bowel spasm with distension.²

The criticism of all these techniques is the absence of a sphincter. Following the encouraging reports of the Heitz Boyer-Hovelacque procedure for exstrophy of the bladder in children,³ we have had an early encouraging experience in adults with a continent urinary diversion based on similar principles. The ileocaecal segment is isolated and the ureters anastomosed to the tail of the terminal ileum. A separate isolated length of ileum is then anastomosed to the caecal urinary reservoir and sleeved submucosally for about 10 cm through the anterior wall of the intact rectum and anal canal, to open on the perineum within the anal sphincters. It is too early to say whether problems with metabolic absorption will arise, but this continent diversion within the natural sphincter seems preferable in principle to intermittent catheterisation of a urinary reservoir. We hope to develop this technique, while agreeing that urinary continence must not be achieved to the long-term detriment of renal function.

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¹ Ashken, M H, *Journal of the Royal Society of Medicine*, 1978, **71**, 357.

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Legionnaires' disease and acute renal failure

SIR,—The occurrence of acute renal failure or transient impairment of renal failure in legionnaires' disease (Professor D N S Kerr and others, 19 August, p 538) would not come as a surprise to anyone familiar with the work of the late James Reilly on autonomic irritation¹ and still less to anyone who had read his monograph on the role of the autonomic nervous system in renal disease, published in Paris unfortunately in 1942, which summarises the result of six years' work on over 1000 animals.²

Among other findings, Reilly showed that the toxins of bacteria, both Gram-negative and Gram-positive, constantly produced albuminuria and haematuria in experimental animals when placed in contact with sympathetic nerves, such as the splanchnic, or if injected intravenously.² The microscopic changes, congestion, haemorrhages, exudation, and sometimes thrombosis of glomeruli were identical with those seen in a series of 80 human subjects dying in a large fever hospital from overwhelming bacterial infections of all kinds.³

Such changes are seen less often since the elimination of the common infectious illnesses with antibiotic therapy. Gram-negative infections are an exception, and Reilly showed quite decisively that damage can occur with over-enthusiastic antibiotic therapy (“frappe fort”) releasing overwhelming amounts of endotoxin. Post-mortem findings in human subjects as well as experimental