of self-interest) needs to be mentioned. In theory the universities are independent and decide on how many undergraduates they will take in any faculty according to the demand for places and the powers of persuasion of the senior academics in that discipline. In practice, things are different: universities with medical schools depend on the University Grants Committee for all but a tiny fraction of their funds. So the UGC reaches "understandings" with universities about how many medical places they will make available, but, for practical purposes, its control of finance is such that these informal agreements are mandatory. "Earmarked" grants are not usually made, and universities are then left to finance medical expansion as they may within their total allocation. So an unexpected and apparently unnecessary stage in the process means that the heads of university medical departments have to argue with their non-medical colleagues for adequate funding—no easy task when in real terms the total budget is often reduced.

In turn, the UGC's theoretical independence may be just as much a facade as the extravagant Regency one it exists behind in Park Crescent. The fact is that when it comes to medical numbers the widely respected members of the UGC often have little choice other than to allocate the orders placed by ministerial officials from the DHSS. There, as in all ministries, the Pavlovian reflex of always asking for more is well established and in the matter of medical numbers is not easily broken—particularly given the recent heavy losses of trained doctors to practise abroad.

Clinical professors might be expected to wield at least some influence on the scene. They are often criticised as globe-trotters, but, because of these wide international contacts, many have better first hand information about world medical manpower than most other doctors. Many of these professors, however, work in medical schools committed to expansion, and hence a conflict of interest immediately arises. Their long-promised new hospitals, new medical schools, new staff all depend on such expansion, so—despite their personal misgivings about a future increase in the number of new doctors—they find themselves having to argue the case for expansion. In turn, vice-chancellors have similar pressure put upon them, as the call of "medical expansion" seems the one which can influence the UGC to relax its purse-strings.

Ministries function on the old army basis of asking for twice as much as you really know you will get, and ultimately making do on what their Minister can achieve in cabinet; they are thereby provided with a comprehensive and automatic excuse for any deficiencies in their performance. So, presuming the right course for Britain to be following at present is a reduction in medical student numbers, it is beyond belief that a minister would have the courage to ask for fewer.

In solving this problem we must emphasise four main points. Firstly (because governments have responded to public pressure that more doctors are a good thing), that there is now a real danger of serious and imminent overproduction of doctors all over the western world. Secondly, that the evidence of overproduction is clear enough to rule out the charge that it is mere propaganda by self-interested groups such as junior doctors who foresee unemployment. Thirdly, that decisions cannot wait for the Royal Commission to report. Fourthly, that the question needs continuous review—no once and for all answer is possible—and a manpower forum,[7 9] possibly similar to the Review Body, has much to commend it.

As things stand at present, difficult decisions fall to the Secretary of State. But, as Maclure says of the teacher problem, "getting the planning right depends as much on political nerve as it does on statistics." The nature of the decision on medical student numbers and the time scale of its consequences make it unrealistic to expect that anyone with the power to act will have the political incentive to do so. So it would be wise to take such decisions out of politics. We may have no Lemuel Gulliver to solve our problems for us (though, happily, he was responsible for the victory of the small-enders), but these do need considering in an atmosphere of calm, disinterest, and objectivity.

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Brucellosis—going?

Is the campaign for eradicating brucellosis from British cattle making good enough progress? What is the extent of active brucella infection in the people of Great Britain? And how may the diagnosis of brucellosis in man be most easily and reliably confirmed in this country at present?

In March 1976, in Glasgow, a medical-veterinary symposium organised by McAllister[1] devoted a day to studying these and other questions about brucellosis. There is encouraging evidence that the campaign to eradicate the disease from cattle may enter its final phase in 1980.[2] The task must not be underestimated. Special measures are needed to detect infection—there is no equally convenient equivalent of the tuberculin skin test, which played so important a part in eradicating tuberculosis from cattle. Careful planning is also required to avoid disruption of farming and to maintain supplies of milk during the process of eradication. Estimates based on previous surveys suggested that 30% of herds were infected; and current serological tests put the figures at around 14%. Serological diagnosis in cattle was complicated by the use of live S19 vaccine in cattle older than six months, and special measures had to be introduced to safeguard uninfected herds, to provide adequate compensation for slaughtered infected animals, and to ensure adequate numbers of replacements. By the end of 1975 there were 104 000 United Kingdom herds (65%) in the eradication scheme; in Scotland[3] the corresponding figures were 24 000 (90%).

Latency of infection is a problem, as is the relatively small staff available to deal not only with brucellosis but also with the control of other important infections of livestock. The rewards of success, however, will be considerable to both agriculture and human health and may be held to justify the estimated cost of eradication, which is not less than £150 million.[2] We may look forward hopefully to 1980. The true number of active cases in the United Kingdom is hard to estimate.[4] In 1975, the figure for England was put at 600 new cases each year[5]; but Henderson,[6] basing his opinion on careful clinical assessment combined with serological findings, put the figures for England at 217 in 1973 and 162 in 1974.

Laboratory diagnosis in Britain of brucella infection in man unfortunately depends almost wholly on serology. Blood cultures usually yield a disappointingly low proportion of positive results, though Payne[7] reported success from over half in the acute stage. The reasons for generally poor results deserve close examination. The prevalent British biotypes may be more difficult to grow than those found in other parts of the world, or there may be other explanations. Attempts to refine serological methods[8 9] are, indeed, being pursued with great devotion. They have tended, on the whole, to be of greater academic than practical interest and—in terms of clinical diagnosis and control of treatment—not to justify the hopes often aroused by increasingly complex methods. The standard agglutination test, properly carried out with good, reliable antigen, will usually provide very little less relevant information than the numerous other tests brought in during the past 15 years. More important, the interpretation of serological results requires understanding of what they establish and what they do not. Serological evidence of infection (particularly among farmers and veterinarians) may be shown to be at a very much higher level than the incidence of clinical disability. Clinical history and signs, critically assessed, are a necessary part of any decision about whether positive serological findings, by any test, denote active disease.

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Urinary tract infection in boys

Urinary tract infection in boys is widely believed to be associated with underlying structural abnormalities of the urinary tract. Twenty years ago Macaulay and Sutton[1] reassessed a group of 32 children six to seven years after their first infection at ages between 3 weeks and 4½ years. Five of the ten boys, all with gross abnormalities of the genitourinary tract, had died; the 22 girls were all still alive.

More recently DeLuca *et al*[2] reviewed 1279 children with recurrent urinary infections. Of these, 203 (143 boys and 60 girls) had had an obstructive uropathy and in them symptoms had started early in infancy or during the first three years of life. Of the 1076 children with no evidence of obstructive uropathy, the sex ratio was reversed—834 girls and 242 boys—and their symptoms had generally started between the ages of 3 and 5 years.

Steele *et al*[3] re-evaluated a group of 133 patients admitted to hospital as children with a urinary infection between 1940 and 1950. The mortality and the incidence of renal insufficiency were four times greater among the boys than the girls and were inversely related in both sexes to the age of onset. Smallpiece[4] reviewed 343 children with urinary tract infections including 42 girls and 34 boys under the age of 3 months. Severe infections were common in this group; one of the boys had a urethral obstruction but the remainder had anal abnormalities with gross contamination of the urinary tract through fistulae. Over the age of 3 months there were 219 girls and 48 boys, and renal tract abnormalities were found in 18 (37%) of the boys and in 44 (20%) of the girls.

Against this background it is a little surprising that two more recent studies of urinary tract infections in boys suggest that the prognosis may be less grave. Cohen's prospective study[5] of 57 boys presenting with their first urinary tract infection showed that they could be divided into two groups. Boys aged under 10 years usually had fever and a high incidence (76%) of abnormalities of the urinary tract, most commonly vesicoureteric reflux. Four boys, all aged under 10, required corrective surgery for urethral valves, ureteric reimplantation, correction of bilateral hydronephrosis and hydroureters, or ureterectomy. Boys aged 10-14 years were usually afebrile and commonly presented with frequency and dysuria. Only two out of 13 had radiological abnormalities. Moreover, in seven of the 57 boys quantitative urine cultures yielded fewer than 10^3 organisms per ml; all of these seven boys were under 10 and all had serious renal abnormalities; three required surgical correction. In the 57 boys Gram-positive cocci were more common and *Escherichia coli* less prevalent as the infecting organism than in a previously studied group of girls.

The second study,[6] of 73 boys aged 2-12 years presenting with their first urinary tract infection, showed that 22 had radiological abnormalities—including reflux, radiological scars, duplex kidney or ureter or both, ureterocele, horseshoe kidney with hydronephrosis, obstructed megaureter and hydronephrosis, pelviureteric junction obstruction, and stone. Only two boys, however, needed urinary tract surgery. Six of the boys with radiological abnormalities had only probable or doubtful urinary infections. *Proteus* species predominated as the infecting organisms, and cultures of preputial swabs suggested that the source of infection in boys might be the prepuce or urethra rather than the bowel, as in girls. In that context, Bergstrom[7] compared nonobstructive urinary infections in a group of 44 boys and a control group of age-matched girls presenting with their first urinary infection. Again, the boys had a higher rate of infection with *Proteus* species and other organisms while in the girls the predominant organism was *E coli*. The incidence of reflux was similar, but eight out of 40 boys had radiological scarring of the kidneys compared with only one out of 30 girls.

What conclusions may we draw from these studies? Clearly we want to separate out those children, both boys and girls, who have an underlying renal abnormality, commonly some form of congenital obstructive lesion. These patients are likely to present in the early years of life, their prognosis may be poor, and surgical intervention will be necessary in some. What microbiological criteria are used for diagnosing a urinary tract infection will depend on sampling techniques. With suprapubic aspirates any bacterial growth on culture is important. Using mid-stream urine samples, Kass[8] proposed that a pure growth of over 10^5 organisms/ml should be taken as clinically significant bacteriuria. Yet some of the patients described in the studies just reviewed had important urinary tract abnormalities and symptoms, but the results of quantitative bacterial cultures were reported as being below this level. Perhaps, therefore, we should review the criteria and include lower bacterial counts when making the diagnosis.

Children with non-obstructive urinary tract infections form a separate group. This problem is commoner in girls, and the sexes also show differences in the predominant infecting organisms. There is a considerable incidence of vesicoureteric reflux, but the very low incidence of bacteriuria in neonates[9] suggests that it develops after the first month of life.