the relation between neuroticism and bowel habit, in the context of controlled clinical trials of high fibre diets in the treatment of irritable colon syndrome. That such trials are likely to take place is suggested both by the controversy over the value of high or low residue diets and by the lack of other successful treatments. Codeine has been found useful in diarrhoea and the senna glycosides in constipation, but the relief of abdominal pain is less satisfactory; intravenous anticholinergic agents are very effective, but taken by mouth they have been disappointing, though some benefit has been shown in controlled trials.

Apart from dietary regulation, psychotherapy offers the most promising treatment. This includes reassurance and explanation to the patient, who is likely to have suffered not only the rapid performance of essential investigations such as haemoglobin, sedimentation rate, proctosigmoidoscopy, barium enema, and examination of stools for blood, but earlier a long series of unnecessary investigations on the stomach, gall bladder, and uterus (one or all of which may well have been removed); all this followed by a long period of diagnostic confusion and uncertainty and finally the advice that there is nothing at all the matter with him and the implication that his pain is imaginary or hysterical. Psychotherapy also includes discussion of and help with current problems and stresses, which the patient may be too diffident to mention himself in the atmosphere of a busy outpatient clinic. Improvement is often associated with a distinct change for the better in some important aspect of the patient's life; it is quite likely that conscientious people are particularly prone to bowel disorder, and it is these very people whose strong sense of duty makes it difficult for them to escape from such a stress as an impossible job situation; they may need medical sanction to make the required change.

It would be possible to include a trial of psychotherapy with a trial of high residue diet in a latin square design both in the irritable colon syndrome and in obesity, for which a high fibre diet has also been suggested. In such trials we could learn not only about the effect of fibre and moral fibre on the bowel, but also the effect of fibre on moral fibre. A positive result might trial a miller's bran against a benzodiazepine in neurosis. Certainly this is a field in which there is wide scope for co-operation between the gastroenterologist and the psychiatrist.

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Paying for Medical Education

A neglected but considerable element in the cost of the N.H.S. is the expenditure on training doctors and surgeons. This cost tends to be overlooked partly because it is split between the University Grants Committee and the N.H.S. and partly because it is usually not disentangled from the accounts of universities and hospitals. But the 1968 Royal Commission on Medical Education estimated the cost of undergraduate medical education at £30 to £35 million while making no attempt to put a figure on spending on postgraduate education. Since then the number of medical students has gone up, and so have costs. The figure of £10,000 as the cost of educating one medical student, calculated in the early sixties and accepted by the Royal Commission, must now be nearer £15,000. So probably more than £50 million a year is now being spent on medical education. It would be surprising if this amount of spending were not to receive increasingly critical scrutiny, in the current concern about public expenditure. Indeed, Lord Annan, Provost of University College, London, has recently written, "Any university with a new medical school... will find that every department will be squeezed by the anaconda of the costs of its medical school." In particular, it looks as though there is about to be a revival of interest in the proposal for replacing—in whole or in part—student grants by student loans as a device for easing the financial burden of higher education on public funds.

Recently the all-party Expenditure Committee of the House of Commons recommended that a system of loans should be introduced for postgraduate students, to supplement but not entirely to replace grants. As the committee pointed out, in many European countries and in North America loans are considered a normal method of helping to pay for maintenance while studying—and not just for postgraduates, it may be added. How might such a system work?

The most hopeful model is one now being discussed and tried out in the U.S.A. This offers what are called income contingent loans in which repayments are related to income: thus a doctor will pay a fixed percentage—say, 4%—of his or her income for a period of 20 or 30 years, and so will not be penalized for dropping out of employment for a spell (crucial if women are not to be discriminated against) or for choosing to follow a career, like research, where rewards are relatively low. Such a scheme can be financed either by the state or by banks with a government guarantee.

In the U.S.A. this kind of approach is being discussed in terms of all students, whether undergraduate or postgraduate. But clearly different kinds of argument apply to the two cases. As the Robbins Committee on Higher Education pointed out, a system of loans for students might have "undesirable disincentive effects" by discouraging children from less well-to-do families who are already under-represented in the university population—and particularly so among medical students. This disincentive argument does not apply with equal force to postgraduates, who have already made the decision to enter higher education. In their case another argument put forward by the Robbins Committee carries special conviction—namely, that higher education is an investment which brings with it the prospect of higher earnings and that consequently "the recipient of the subsidy is being put in a position to command a higher income in virtue of taxes paid, in part at least, by those whose incomes are smaller."

Applying these arguments to the circumstances of medical students raises some difficulties. On the one hand, medical graduates can expect higher life-time incomes than most other university graduates. To this extent, the case for loans seems particularly strong. On the other hand, the cost of their training can be seen as a subsidy not to them personally but to the N.H.S. as a whole: significantly, perhaps, medical earnings in countries with loans rather than grants tend to be relatively higher than in Britain. Further, there is the problem of doctors.
Choice of a Mild Analgesic

The United Kingdom is soon to follow the lead given in 1961 by Sweden and Denmark in making phenacetin available only on prescription. The question therefore arises whether there is ever any indication for prescribing it.

First used towards the end of the last century, phenacetin remained a popular analgesic for many years, almost entirely as a constituent of mixed analgesic tablets and powders. In Great Britain it has most commonly been mixed with aspirin, codeine, or caffeine, whereas in some other European countries the usual mixture has been phenacetin, phenazon, and caffeine. Despite their long popularity there is no evidence that mixtures of analgesics have any better therapeutic effect or less chance of being toxic than the equivalent total dose of a single active analgesic drug.

The choice of a mild analgesic for headache or musculoskeletal pain of moderate intensity lies primarily between aspirin, phenacetin, and paracetamol. Codeine, a common constituent of analgesic mixtures, is a relatively weak analgesic, and in addition its constipating action renders it unsatisfactory to be prescribed alone as an analgesic. The derivative, dihydrocodeine, is a more effective analgesic, but it also tends to cause constipation. There is a slight degree of danger of addiction with continued use of codeine or dihydrocodeine. Phenacetin and paracetamol have similar analgesic potency to aspirin, but they lack the anti-inflammatory action of the latter. Aspirin is thus superior in the treatment of rheumatoid arthritis and other conditions where the anti-inflammatory effect may have additional value. Otherwise, judged purely on analgesic effect, these three drugs are similar, and the choice must depend on the possible adverse effects of their use.

The toxicity of these compounds can be considered in three contexts—occasional use of therapeutic doses, regular consumption over a long period, and acute overdosage. For occasional use aspirin has been consumed on a vast scale and on the whole has stood the test of time. The main adverse effects are dyspepsia or gastrointestinal haemorrhage. These two effects are not closely related, and serious bleeding can occur without any dyspeptic symptoms. The association between aspirin ingestion and acute massive gastrointestinal haemorrhage must be relatively uncommon in relation to the frequency with which aspirin is ingested. It seems reasonable to advise patients with peptic ulceration not to take aspirin, especially those who have already suffered gastrointestinal bleeding. Furthermore, aspirin should certainly be avoided by patients who have conditions associated with an increased bleeding tendency, such as thrombocytopenia or haemophilia. Aspirin also has the disadvantage of occasionally causing allergic reactions, including asthma and urticaria, and any patient who has previously suffered such a reaction should avoid the drug. For occasional use phenacetin and paracetamol appear to have little toxicity. Both are free from the danger of gastrointestinal haemorrhage, and allergic reactions are not a feature of their use. Phenacetin may cause the formation of methaemoglobin, Heinz bodies, and, rarely, acute haemolysis by oxidative damage of red cells, probably produced mainly by the metabolite, p-phenetidine. These effects occur particularly in people with deficiency of glucose-6-phosphate dehydrogenase or of other red-cell enzymes which protect against oxidative damage. Moreover, individual variations in the metabolism of phenacetin may explain why some people are more susceptible to this effect. Phenacetin may rarely cause an immune type of haemolytic anaemia. The use of paracetamol avoids these disadvantages both of aspirin and of phenacetin, and as an occasional analgesic it appears to be remarkably non-toxic.

Continued regular ingestion of analgesics raises further important problems of toxicity. After therapeutic doses of aspirin about 70% of people lose up to 10 ml of blood daily from the gastrointestinal tract, and a small proportion lose much more. Even a small loss of blood continuing over a long period may be sufficient to cause iron deficiency in people whose iron balance is precarious. Surrupitious repeated ingestion of aspirin is often overlooked as a cause of iron deficiency anaemia of obscure aetiology.

The most serious problem of chronic analgesic intake is the vexed question of nephropathy. There is no doubt that many patients who consume analgesics regularly for years ultimately develop severe renal damage with papillary necrosis. As in most cases phenacetin has been a constituent of the mixed analgesic preparations taken it has been held to be the culprit. However, some workers have maintained that other analgesics, including aspirin, are also potentially important causes of analgesic nephropathy. It appears reasonably certain that phenacetin may cause nephropathy; the risk, if any, from the other drugs is less clear. Aspirin has produced renal papillary necrosis in animals. In man it has caused increased excretion of renal tubular cells and occasional cases of renal papillary necrosis have been reported in patients who had consumed only aspirin without other analgesics. However, in two recent studies no association was found between aspirin intake and evidence of renal disease in patients with chronic arthritis who had taken large amounts of the drug for many years. As the mechanism of phenacetin-induced renal damage is not clear, the main metabolite of phenacetin, paracetamol, has also come under suspicion. Occasional cases of nephropathy have been reported in patients who had consumed large amounts of paracetamol but apparently no other analgesic. But aspirin and paracetamol have been taken in vast quantities, mainly as single drugs (in contrast to phenacetin), and the few documented cases of nephropathy attributable only to aspirin or paracetamol appear to make it clear that these drugs, when used alone, are not so likely as others to cause analgesic nephropathy. The possibility exists that mixtures of analgesics are more prone to cause renal damage than single drugs and that is another reason for avoiding the mixed preparations. The most important point is that habitual consumption of any analgesic is potentially dangerous, and continued long-term use of them should always be under medical supervision for adequate therapeutic indications.

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