rises, while that of potassium falls. Both acetazolamide and spironolactone are said to be of prophylactic value against mountain sickness, though the mechanism of their action is unknown, and that of spironolactone must be mediated by a mechanism unrelated to aldosterone antagonism. Whether the use of these drugs lessens proteinuria at altitude remains to be studied. Pines found haematuria (as detected by Bili-Labstix) in some of his subjects, which is further suggestive evidence of direct renal damage at altitude.

Acute hypoxia seems, then, in some way to lead to loss of protein in the urine. With acclimatisation this loss lessens but does not disappear. Apparently chronic hypoxia, whether due to residence at high altitude or to a right-to-left intracardiac shunt, has the same effect. Since, however, the extent of the proteinuria so caused is small and neither causes hypoproteinaemia nor otherwise threatens health, there can be no justification for taking renal biopsy samples from volunteers in high-altitude laboratories—and the morphological appearances of the kidney exposed to rapid ascent to high altitude may therefore remain unknown. There is no reason to believe that the kidney is the prime cause of the various manifestations of mountain sickness; probably the sequence of events set in train by progressive hypoxia and hyperventilation affects the kidney along with other organs.

[1] Singh, I, *et al*, *New England Journal of Medicine*, 1969, **280**, 175.
[2] Pines, A, *British Journal of Diseases of the Chest*, 1978, **72**, 196.
[3] Rennie, I D B, and Joseph, B, *Lancet*, 1970, **1**, 1247.
[4] Rennie, I D B, *et al*, *Journal of Applied Physiology*, 1971, **31**, 257.

Cancer after cardiac transplantation

The striking increase in the incidence of lymphoid neoplasms in patients who have transplants is intriguing but unexplained. Recent reports[1 2] from workers at Stanford have left no doubt that the increased risk is not restricted to renal transplantation and that there is a similar raised incidence of these neoplasms in patients who have had cardiac transplants. The first report by Krikorian and his colleagues[1] gave details on all 124 patients who underwent cardiac transplantation at the Stanford University Medical Center between January 1968 and April 1977. The median survival of these patients was 18 months, and, of the 35 deaths which occurred over three months after transplantation, four were due to malignant disease: two lymphomas, one acute myeloid leukaemia, and one adenocarcinoma of the colon. In addition, there was another case of lymphoma and two cases of squamous carcinoma of the skin among the survivors at the end of the study period. These seven cases contrast with an expected number of 0·4 in a normal population. No differences were detected in the frequency of rejection episodes or in the HLA compatibility of the graft in patients with lymphomas when compared with other patients.

A later report from the same centre by Anderson *et al*[2] gave information on an additional 19 patients, bringing the total studied to 143, and extended the follow-up to June 1978, by which time no fewer than six patients had developed lymphoma. This second report discussed several risk factors that had been undetected in the earlier study. In particular, the risk of lymphoma among recipients of cardiac transplants was found to be higher than after renal transplantation. This difference was entirely due to the very high risk of lymphomas in patients whose primary disease had been cardiomyopathy. The other risk factor was young age at transplantation. In fact, all six patients with lymphoma had had cardiomyopathy and were aged less than 40 years.

Several hypotheses have been put forward to account for the excess of lymphoid neoplasia in patients who have had transplants, and these have recently been well reviewed by Hoover.[3] They included impaired "immunosurveillance," chronic uraemia (itself immunosuppressive), the chemical carcinogenicity of immunosuppressive drugs, oncogenic viruses, chronic antigenic stimulation, and graft-versus-host reactions—or a combination of some of these factors. The fact that by no means all types of malignancy are increased in incidence argues against a simple interpretation of the concept of impaired immunosurveillance, while the unusually short induction period of these neoplasms makes the chemical carcinogenicity of the drugs unlikely. The authors of these recent reports have postulated that, as idiopathic cardiomyopathy is characterised by a defect in mitogen-induced mononuclear-cell suppressor activity, the cause of lymphomas in patients who have had transplants may be defective regulation in the immune system in the presence of the antigenic stimulation of the graft. Nevertheless, the fact that recipients of renal transplants who have polycystic disease share in the increased risk of lymphomas[3] suggests that an underlying immunological defect is not crucial for the development of these neoplasms.

Further light would be thrown on this question by information on the incidence of lymphomas in idiopathic cardiomyopathy in the absence of transplantation. We also need information on the incidence of malignant disease in patients who have not had transplants but have received immunosuppressive drugs.

[1] Krikorian, J G, *et al*, *Journal of the American Medical Association*, 1978, **240**, 639.
[2] Anderson, J L, *et al*, *Lancet*, 1978, **2**, 1174.
[3] Hoover, R, in *Origins of Human Cancer, Book A*, eds H H Hiatt, J D Watson, and J A Winsten, p 369. New York, Cold Spring Harbor, 1977.

General practice evolution

Britain is fortunate in having a competent and comprehensive general practice service. Despite the occasional well-publicised lapses in standards, most of the public are satisfied with their family doctors. But GPs are worried about the standards of service they can offer and the diminishing rewards for looking after patients. Even so, as the costs of hospital medicine rise, its staffing difficulties multiply, and waiting lists lengthen, the value to the community of a sound primary care service increases. By now, most people realise that resources for health will always be limited. Thus it is sensible to treat as many patients as possible outside the expensive institutions, provided that this can be done safely and effectively. Such a policy is economical, is usually more convenient for patients, and ensures that those who really need a hospital bed for investigation or treatment can have it promptly. A call for such a switch in work and resources from hospitals to general practice is the foundation on which the General Medical Services Committee's New Charter Working Group has built its report, published on 16 February (p 564).

The working group, chaired by Dr J G Ball, adopted a responsible approach to the task of fulfilling the Newcastle upon Tyne motion approved by the 1977 LMC Conference: "This conference deplores the reduction in general practitioners'

living standards due to their relatively low remuneration. It asks for a completely new charter to be negotiated to ensure that the average net remuneration of a general practitioner be comparable with the medical remuneration in countries in the EEC."[1] Dr Ball and his colleagues could have constructed a straightforward pay claim (with examples of highly paid European doctors), camouflaged it with some fine-sounding medicopolitical phrases, and presented the package to an enthusiastic LMC Conference last year. Fortunately for the future of general practice they chose a harsher road, emphasising their first main objective as "the welfare of our patients" and their second as "the well being and unity of general practitioners, without which the attainment of the first objective would be jeopardised." The generally favourable reception accorded the report and its authors by the GMS Committee last week (p 568) showed that the committee members, too, were as concerned about the future standards of general practice as they were about the decline in GPs' living standards. This is the right attitude for a profession.

Fifteen years ago general practice faced a severe crisis: it was saved by the 1965 Family Doctor Charter,[2] which signalled a revolution not only by providing substantially more pay for GPs but also by changing to a system of payment that encouraged doctors to provide better surgery premises and more supporting staff, to increase their postgraduate training, and to take more time off. The result was an increase in the numbers of general practitioners, a restoration of morale, a great improvement in professional status, and an impetus for the development of undergraduate and postgraduate training, which culminated in the Vocational Training Act.[3] Nevertheless, the social and economic pressures on the Health Service in the past five years or so have threatened to undermine some of the first charter's successes.

Was this threat to be countered by another radical change in the way primary care was given and paid for or did the medicopolitical circumstances, so different from the 1965 confrontation with the Government, dictate an evolutionary solution? After studying the extensive evidence given to it the working group decided against revolution. It has opted for preserving the general principles of the present contract, including the all important independent contractor status (a protection against bureaucracy for patients as well as GPs), while proposing that remuneration be more closely related to the family doctor's work load than now, especially his out-of-hours responsibilities, and calling for a big reduction in the average list size, to 1700, to allow GPs more time to see their patients.

So there are no radical proposals for charging patients or for introducing a salaried service, which will disappoint minorities within the profession. There may also be some GPs who will be disappointed that Dr Ball's working group have acknowledged unequivocally that "the family doctor recognises his professional and ethical responsibility to his patients of providing continuing care." But this obligation, the report points out, is distinct from the contractual commitments of the NHS. So it is proposed that the new contract would contain basic commitment payments related to service in normal working hours and supplementary payments which would include fee-for-service payments for out-of-hours work, with higher rates for "out-of-bed" and weekend duties. Furthermore, the working group argue in favour of a narrower definition of average net remuneration—the Review Body's annual target recommendation for GPs—by excluding those services not open to all GPs to do.

The report does not attempt to define normal working hours. Indeed, the authors are generally coy about putting figures to any of their numerous and detailed proposals—with the exception of manpower, where they forecast that 2000 new entrants a year will be needed to achieve the called-for reduction in list size. Readers avidly seeking how much extra pay the new contract might bring to them may be frustrated by this omission, but by the time these proposals—no doubt modified by the LMC Conference in June—reach the negotiating stage any financial figures would have been outdated by inflation. In any case, some details—for example, about hours—are best left to the profession's negotiators, who will require room for manoeuvre when meeting the DHSS later on this year. On the pay front the working group's most important aim has been to produce a framework for remuneration that would be responsive to the changes in pattern and amount of work that are bound to occur in the next decade, a path already taken by junior and senior hospital doctors, and one that will be of help during times of pay restraint. Though inevitably there will be differences among GPs about this or that idea—and several GMSC members started the debate by challenging the novelty of a continuity payment for the care of identifiable chronic disorders—they have broadly succeeded in this aim.

Since the NHS started, the question of how much a doctor was worth has never been answered to everyone's satisfaction. The Review Body was set up to find an answer, but, paradoxically, it is under siege by some in the profession[4] just at the time when employees of other monopoly State organisations are wondering whether a comparability pay board might be the solution to their persistent low pay. The new charter working group has made two practical suggestions that could help in estimating the value of a doctor's services. It asks the BMA to prepare a list of recommended fees for *all* services for general medical care—at present most of these are excluded from the Association's list of recommended fees. The report also argues that the standard fee-for-service payment for out-of-hours work should be "a gross fee, unmodified by any complementary or supporting payment." This could provide an important reference point for making external comparisons on pay, one of the essential functions of the Review Body. Other practical proposals on remuneration appear in the chapter and appendix on practice expenses, where as well as sensibly recommending that the GMS Committee monitors a sample of practice expense returns quarterly to provide an up-to-date picture, information lacking at present, the working group has set out a helpful aide-memoire for submitting practice expenses records to the Inland Revenue.

All GPs in the NHS are being sent this report. All should read it, for the contents could affect their professional life for the next decade. Family doctors should applaud the aim of better care for patients; welcome the report's support for GPs' continued independence; study the proposals for providing locums; examine carefully the chapters on the contract and pay; follow the advice on practice expenses; think hard on the authors' pragmatic advocacy of audit, supervised by LMCs; argue about the optimum list size and the best use of ancillary staff; build on the suggestions for care in socially deprived areas; brace themselves to argue nationally and locally for a bigger share of the NHS's resources—and work; and, finally, thank the working group for preparing a constructive document that deserves a vigorous debate throughout the Health Service and beyond.

[1] *British Medical Journal*, 1977, **2**, 403.
[2] BMA, *A Charter for the Family Doctor Service*, 1965.
[3] *National Health Service (Vocational Training) Act* 1976. London, HMSO, 1976.
[4] *British Medical Journal*, 1978, **2**, 367.