

THE ROCK CARLING FELLOWSHIP

1975

CHANGE IN
MEDICINE

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THE NUFFIELD
PROVINCIAL HOSPITALS TRUST

1975

CONTENTS

<i>Acknowledgements</i>	ix
<i>Introduction: Ernest Rock Carling</i>	xi
1 Evolution	I
2 The translation of scientific appraisal into practice	6
3 The response to advance in medical science	18
4 The growth of specialization	27
The subdivision of specialties, 29	
5 Change in general practice	33
6 Change in preventive medicine	40
Communicable diseases, 40. Prevention by change in behaviour, 41. Prevention through health education, 43. Chemical factors in the environment, 45. The development of central control, 47. Prevention by earlier diagnosis, 48. Screening for inapparent disease, 51.	
7 Change in health professions	56
8 Progress by consensus	67
9 'Resources for health care'	76
10 Change in clinical practice	85
Advance by agreement, 85. Clinical freedom, 86. Selection of patients for treatment, 88. The development of specialist teamwork, 91. Priorities in medical care, 93. Intensification of hospital use, 96. Levelling up standards, 98. Review of personal competence, 101. Change in psychiatric care, 102. Change in geriatric care, 105. New burdens of ill-health, 106.	
11 Prospect	107
The service as an entity, 109. Resources, 111. The selection of priorities, 112. The emerging district complex, 113. Regional planning, 114. Professional developments, 116. Technical progress, 118. The public and the profession, 120. A final assessment, 122.	
Epilogue	123
<i>Note on main sources</i>	125

INTRODUCTION

ERNEST ROCK CARLING

Ernest Rock Carling's primary contribution was to clinical medicine as one of the leading surgeons in Britain in his day. He had interests which went far beyond this, particularly in the organization of medical care and he himself made major contributions to promote change in medicine, about which I shall be mainly concerned in this monograph. He was serving his country overseas at the beginning of the century and served again in the First World War. In the Second World War as adviser to the Ministry of Home Security he contributed largely to the successful organization of the treatment of casualties during air-raids in this country. These emergency activities, however, were minor features in a career which was mainly concerned with the advance of the field of medicine in which he was especially interested, the treatment of malignant disease. His work in peace extended far beyond this because of his interest in the organization of health services as a whole. He had had a major part in the planning of the last general hospital to be completed in Britain before the war in 1939 and his original approach to the planning of an acute hospital service with integration of out-patient and in-patient services has had an influence on much that has gone into hospital planning since. The particular design was a mistake because it left no room for later variation, but who has yet designed a hospital which later generations have not found at least as mistaken? In spite of his many other commitments during the war he took part with T. S. McIntosh in one of the largest of the hospital surveys that were conducted with the support of the Nuffield Trust and of the Ministry of Health on hospitals in England and Wales. McIntosh and Rock Carling surveyed the hospitals in the north-west, the area covered by the Manchester and Liverpool Area Health Authorities today. They, with Topping and Gray, largely influenced the thinking of the teams of surveyors which undertook

Introduction

the review of all the hospital services of England and Wales at that time. What has been called the Domesday Book of the hospital service may now be largely forgotten, but much of the regional planning and the rationalization of development of our hospital services thereafter stems from the work that was done in those surveys.

Ernest Rock Carling had an incisive mind and a ready tongue, but he was the most approachable man who formed friendships with many who were far younger in age if not in thought. I had the good fortune to be of that group and to know him well in his later years, when he was contributing as a founder member of the Central Health Services Council and of the Standing Medical Advisory Committee, and as the first Chairman of the Standing Committee on Cancer to the new National Health Service. The emergence of those bodies as the important influence that they have been in the first quarter of a century of the NHS in procuring change in medicine, was due, after Lord Cohen and Sir Fred Messer, as much to Ernest Rock Carling as to anyone. It has been an affectation of some to decry the work of those advisory bodies. Yet anyone who sets out to write the history of the first quarter of a century of the NHS with true insight into the way in which many advances were procured must realize that although the debates of the Council and its committees were infrequent and perhaps not always profound, they did none the less provide opportunities for the promotion of the new developments in our health services. Without their support the insight that was needed for those developments might not have been attained, and the Ministry of Health might have been far less understanding of the aspirations of the health professions than it proved to be. Ernest Rock Carling's personal contribution to the emergence of a practical organization of services for the treatment of cancer in all regions is perhaps the best known of his contributions to this work. It was a matter of considerable importance that the rifts which did exist between the radiotherapists and the surgeons, gynaecologists, and others with whom they worked, or should have worked, were closed. It was no less important to ensure that the development of radiotherapy was in accordance with regional plans and based upon regional centres large enough to carry staff

Introduction

with the expertise to use effectively the new super-voltage sources of ionizing radiation which became available after the war.

The development of the linear accelerator was not the result of the work of this committee, though some members of the Standing Advisory Committee on Cancer had been closely concerned with it, but the application of the new power that became available with the development of such apparatus did require guidance from the centre to be applied by the regions. That the new sources of ionizing radiation, far greater in power than anything that had gone before, were deployed sensibly and evaluated critically, was as much due to the guidance given by the Standing Advisory Committee as to the participation of the Medical Research Council. It should not be forgotten that before 1948 many surgeons, gynaecologists, and dermatologists were using ionizing radiations without as full knowledge of their effects as was necessary for safety or full effectiveness and that the participation of physicists in this work had been too seldom invited and too little heeded. An earlier Rock Carling monograph described some of this development and I do not propose to go further here than to emphasize what an important part Ernest Rock Carling played in it. One of my earlier encounters with him and with George Stebbing, with whom he worked so closely for the Radium Commission, was in a discussion at a provincial centre intended to persuade the local people, as indeed it did, that they could not go on toying with the kind of apparatus which was then being used in an annexe to the diagnostic radiological department, which itself was supervised only by a general physician in his spare time.

In a broader field in the Central Health Services Council and as Chairman of the Medical Advisory Council of the Nuffield Provincial Hospitals Trust, Ernest Rock Carling used that same capacity for lucid appreciation to promote development, regional planning, and local execution of other services. I recall particularly his contribution to the debates which were the beginnings of the campaign against smoking as the major cause of lung cancer and, in quite a different vein, to promoting the open visiting of children in hospital which was only really given full effect when a sub-committee of the Central Health Services

Introduction

Council produced its major report on the welfare of children in hospital. It is sometimes said of a man that he is a remarkable 80-year-old, it would have been said of Ernest Rock Carling that at 80 he was still a remarkable man.

I

Evolution

Medicine evolved from the earliest times as a continuous process and in most of that period of some five thousand years the advance was in the slow differentiation of diseases and only relatively recently in effective therapy, certain prophylaxis, or the identification of causes. Some discoveries like Roentgen's demonstration of X-rays were quickly applied, but were only marginally useful or even safe until they had been refined and controlled. Jenner's demonstration of the protective effect of vaccinia was only slowly accepted, even though variolation had long been used. Pettenkofer was still rejecting the relationship between contamination of water and cholera at the beginning of this century. New discoveries, unless they happen to fit into an accepted pattern of therapy involving no fundamental change in method, are apt to wait long for general application. That is not necessarily bad and indeed Cochrane¹ has amply made the case for proper trials of new forms of therapy before general adoption.

Most advances in medicine occur by short steps in the modification of existing methods. Similarly, changes in organization of health services occur by short steps as existing systems are modified. Often the formal 'change' may only reflect functional developments which have already occurred. It is only occasionally that longer steps are taken with some statutory change which may make possible more rapid progress. The organization of health services develops in different ways in different countries, just as other differences exist or develop in central or local government. Even the Scandinavian countries which have broadly similar patterns and comparable results have differences in detail, as do the countries of Eastern Europe despite their reconstruction on the Russian pattern after the last war. It is only in the revolutionary situation, when radical social reorganization occurs, that health

1. Cochrane, A. L., *Effectiveness and Efficiency. Random Reflections on Health Services*, Rock Carling Monograph (London: Nuffield Provincial Hospitals Trust, 1972).

Evolution

services also change to some totally unfamiliar form, as most recently in China. Some factor in the process of change may produce an important but unforeseen result on medical practice, with the passage of time.

In retrospect, it is often possible to trace the origins of unplanned changes which have had long-term results—good or bad. If we can discern the continuous threads running through our recent, or even not so recent, history, it may become easier to foresee the need for future changes and to influence them. Unpredicted changes may be seen to have had rational causes. Professional or public objection to changes may become intelligible, even if not acceptable.

The experience of other countries may also be highly relevant to our own situation and needs. The example of some action taken in another country may be applicable here. The district general hospital, for instance, is not an invention of the NHS. It could be seen in the county central hospitals of Sweden, Denmark, and Norway twenty years ago, and the Finns reconstructed their devastated hospital services around regional hospitals with the same function after the Second World War. The maintenance of general practice as the foundation of our NHS is probably the chief reason for its economical features as compared with Sweden, where the highly successful but far more costly health service has been dominated by its hospital component. Paradoxically, the lesson of the successful use of the public health nurse in support of the single-handed general practitioner in Sweden and Norway was applied in Britain to the better development of group general practice, in which doctors work with community nursing and midwifery staff. The advantages of grouping GPs and so achieving a more comprehensive doctor/nurse/midwife team have been recognized only recently in Sweden.

Medicine is more completely international than most other professions engaged in serving the public. The vast medical literature and the constant interchange of medical scientists help to make the corpus of medical scientific knowledge available in all countries. Technical medical methods once developed can be applied in any country which has the necessary resources: there are no secret processes. Even now, when complex specialist teams

Evolution

are required for some specialized work, the commoner medical problems can be understood and handled by properly trained health professionals in most countries. The standard of individual competence varies within comparatively narrow limits and the World Health Assembly has several times debated the possibility of devising a uniform standard medical qualification to be accepted internationally. There are differences such as the greatly shortened course now followed in the Peoples Republic of China and the specialization in the student period in the USSR, but they do not prevent the application of discoveries made in one country in the medical practice of another.

There can be far greater obstacles to the general application of advances in the funding, organization, staffing, and equipment of medical services. In some South American countries insurance systems based on occupational groups were powerful enough to prevent district planning, and so provide effective cover for the whole population, especially in rural areas. In the USA the insistence on free enterprise and private insurance schemes made a comprehensive district organization impossible, even had it been desired. In West Germany and Austria, insurance-based services, which provided the right to consultation with specialists outside hospitals, impeded the development of out-patient departments. On the other hand, in West Germany and France the insurance basis of health services, including cover for dependants, was so strong that it could finance developments without large additional demands on central funds, such as occurred in Australia and Canada. Indeed, in an expanding economy, the system of high-rate contributions in these countries ensured additional funds on a greater scale than in Britain, with its reliance on funds from central taxation.

The orderly development of Scandinavian services was greatly facilitated by the acceptance of public authorities as the providers of district hospital services during the last century. The insurance system was not used to prop up competing local hospitals, nor were powerful charitable hospitals established in opposition. A unified hospital service was provided from a very early stage. The same reliance on elected hospital boards in New Zealand gave that country's service an administrative basis for development. In Britain the predominantly centrally financed service made the

Evolution

development of unified services and uniform standards throughout the country possible. Nevertheless, in twenty-six years we have not surmounted the difficulty of levelling up resources for the worst financed areas. Indeed the rigidity within the service has been such that inequalities in funding of services between the English regions still exist. The only notable gains have been made by Scotland, Wales, and Northern Ireland, with their separate political advocacy, in comparison with England. The NHS may be one of the most economical of the sophisticated health services, but it is also one of those in greatest need of additional funds.

Changes in the quality of medical care can be directly influenced by changes in the organization which facilitate professional development. The three most striking examples in the NHS have been the initial and continuing development of specialist staffing of all district hospitals, the development of group general medical practice in association with the other community services, especially nursing, and the comprehensive immunization schemes to a national pattern. The development of specialist services flows directly from the original regional organization of hospitals. The development of group general practice, moving on to health centres and the association of community nursing staff, was facilitated by specially favourable financial arrangements. The immunization programme was centrally planned on expert advice and assisted by central supply of vaccines.

The habit of some people of describing the NHS as unique or even the best in the world is as uninformed as the penchant of a few for describing it as bad, or crumbling, or at the point of disintegration. The public has repeatedly shown confidence in the NHS and a recent communication of the Presidents of Royal Colleges and Deans of Faculties shows with justice a measured concern for its shortcomings and present difficulties to match an awareness of its true value. The NHS must be judged by comparison with its own past and the record of other comparable countries. Such comparisons have been made recently by Robert Maxwell¹ in a McKinsey Report and Miles Hardie in a paper published in *Long-Range Planning*.²

1. Maxwell, R. *Health Care: The Growing Dilemma* (A McKinsey Survey Report).

2. Hardie, M. 'What should we spend on health care', K.F.C. Reprint No. 846.

Evolution

Simple comparisons of the morbidity and mortality statistics prepared in different countries must be treated with caution, but there is little doubt that the Scandinavian countries, the Netherlands, and Switzerland show better results than Britain. Most EEC countries, Australia, New Zealand, and Canada show some rather worse figures and the USA worse still. Since the figures of individual countries are likely to be internally consistent over time, the more important consideration for us should be the way such countries as Norway, Finland, and Japan have improved their position relative to Britain. Within the United Kingdom, Wales now has a slightly lower rate of infant mortality than England although it formerly had one 10 per cent greater; and Scotland has reduced maternal mortality almost to the level of Scandinavia. These developments have not been studied as they should be. Such changes do not occur by chance and may not be solely due to the proportionately larger funds devoted to the NHS in Scotland and to a less extent Wales.

The scientific advances which make some changes practicable have to be perceived and their application promoted. The professional and administrative perception of, and response to, such advances may often be slow or not synchronized. The NHS has acquired some means of improving its responses and the professions some improvement in presenting their needs, but there is still far to go. These aspects are discussed in subsequent chapters.

The translation of scientific appraisal into practice

In his monograph three years ago, Cochrane discussed the ways of demonstrating that a particular change in medical method is justifiable. He made the point that changes often occur without such demonstration having taken place. There was a time when the observation of certain phenomena, perhaps arising as the result of a particular method of treatment in the hands of a recognized authority, would have been thought sufficient for others to follow on the same line. That sort of demonstration without statistical confirmation is rarely acceptable now. Of course, much change in medical method arises by slow progression, by the improvement of techniques; or, perhaps, by small changes in the molecular structure of particular drugs. It may be that any advantage is slight and only demonstrable by large field trials which it would hardly be possible to organize. In such circumstances, there is as it were a drift of opinion.

How far is it practicable to follow the line suggested by Cochrane in relying upon controlled trials for the demonstration of the value of any new therapy? Clear demonstration might sometimes require a very large series and a number of observers using techniques they have carefully matched. Considerations may not all be of a technical medical kind. For example, some years ago the long series of cases of varicose veins of the legs successfully treated by Fegen in Dublin provided the stimulus to others in this country to adopt the same method. The attraction there was not only the effectiveness of the treatment but also the possibility of carrying it out on an out-patient basis with much less use of hospital time. Admission for surgery in this country would have involved an average stay of thirteen days. There were collateral advantages in having the patient active throughout the period of treatment and in the elimination of loss of remunerative time to

The translation of scientific appraisal into practice

the patient. There were advantages to the hard-pressed hospital service in saving hospital beds. The annual number of admissions for varicose veins operations in England and Wales had been increasing progressively and reached 55,000 before a sufficient number of surgeons were using the out-patient method to reverse the trend. Instead of an annual increase in the ensuing years, a fall of about one-fifth occurred. It is not easy to devise a controlled trial for such a method, but an attempt was made and the conclusion in effect was that both surgery and the injection/compression technique gave satisfactory immediate results in a fairly high proportion of cases. Both methods had some disadvantages and it was impossible to say that either was clearly superior. In these circumstances, change to the injection method is surely justified if, as a result, savings to the patient and in use of hospital resources can be achieved. Neither procedure is left holding the field as the sole method to be used, but the contributions that can be made by each have been substantially clarified. This change was brought about, with departmental support, not by specifying a particular method for widespread use but by supporting the investigation of the injection method by people working and reporting their results independently. In some countries it could have been brought about more simply by directions from the centre, but that kind of intervention has never been attempted here and would rightly be rejected if it was.

The example of varicose veins is one that illustrates the availability of alternative forms of treatment, both equally effective, but using different combinations of the same resources. Another example is the treatment of coronary thrombosis. There has been one attempt at a controlled trial of the relative merits of treating selected cases of coronary thrombosis in hospital or at home. The outcome of that study suggested that there was little to choose; there might even be a slight advantage for those treated at home. This was a selected series. Should it be shown eventually that treatment in hospital brings no advantage to a definable group of patients with coronary thrombosis, it would be reasonable to conclude that, given the availability of suitable conditions at home and the inclination of the patient to be treated there if possible, the service should try to do that in appropriate cases. This would

The translation of scientific appraisal into practice

release resources that might be essential to the treatment in hospital of other patients. But this would be a matter for local decision, not central direction. The method of treatment selected should depend on a combination of doctors and patients who agree, and on reasonable home conditions.

In the USSR there are many research centres in different specialized fields: some established by the Ministry of Health of the USSR, some by the Academy of Medical Sciences of the USSR which is a semi-autonomous body, and some by the Ministries of the individual Republics. The views of the directors of those centres in the USSR may carry such authority as to be almost clinical direction for specialists working in the same field at the periphery. The DHSS in London does not possess, and should not possess, such authority in the clinical field. The DHSS or the MRC, or the two together now, can and do mount investigations through participation of willing medical scientists, however, upon which reliable conclusions can be based by those working in the field. The decision by any doctor to apply those conclusions must always remain a free choice, but it is one he must be prepared to defend to his peers.

The nearest we have come to a defined national policy in the clinical field is in immunization against communicable disease. Many countries have compulsory schemes for immunization; many of them still compel vaccination against smallpox, although that is something we abandoned, even in form, in 1948. Some use the indirect authority of compulsory school attendance by requiring immunization before admission to school. Nothing of that kind has been attempted in Britain. Instead the machinery of the Central Health Services Council has been used to set up a committee of acknowledged experts in this field to suggest policies on immunization.

The first use of such a committee was to advise on immunization against poliomyelitis. Before the committee was prepared to make a recommendation, a field trial was conducted by the MRC partly with funds provided by the DHSS. Use of poliomyelitis vaccine at that time was a highly controversial matter. The subsequent introduction of attenuated, in place of inactivated, poliomyelitis vaccine was recommended on the basis of evidence

The translation of scientific appraisal into practice

obtained abroad and a small trial of antigenic efficiency here. Measles vaccine was subject to field trial in this country, but not to an extensive test of safety because of the very large field use of the vaccine in other countries. BCG had been the subject of an extensive field trial arranged by the MRC.

At the present time we use a standard schedule of immunization recommended by this expert advisory committee in Britain. That schedule is not imposed on doctors as a requirement, but many local health authority schemes for immunization are now computer-operated and it is really only practicable to participate in such a scheme if a single schedule is used. The individual doctor can still opt out and the parents and doctor, of course, have the choice as to whether they should use the vaccines at all. The great benefits of measles vaccine have not been fully exploited in this country because of that very element of personal choice for doctor and parent alike. There are obvious benefits still to be gained: universal use of vaccine would result in 100,000 to 150,000 fewer cases of measles a year and there might then even be no deaths. It is unlikely that vaccination against measles will be absolutely complete in the foreseeable future and, therefore, that measles will be as nearly eliminated as poliomyelitis has been unless a world programme becomes possible; but more could be done. Nevertheless, freedom of choice by parents and doctors is surely preferable to a compulsory system.

Absolute conclusions are not always possible about the use of vaccines. One may be able to show that the risks of primary vaccination against smallpox in the second year of life are of the order of one death in a quarter of a million vaccinations, and an appreciable though small number of cases of illness. The chance of any reaction with a permanent adverse effect on the child is to be measured as one in many tens of thousands, and the disturbance of primary vaccination is small. If there is a likelihood that the child will be exposed to smallpox in later life there can be no doubt at all that it is worth vaccinating him. If the chances are that by the time he is 5 years old smallpox will either have been eradicated from the world, or exist only in a small pocket in Asia from which he may never be threatened, then the risk is not worth taking.

Nevertheless, the parent or the doctor concerned must have the

The translation of scientific appraisal into practice

right to say yes or no. The parent may be aware of the ravages of smallpox and the doctor may have a fervent belief in the value of vaccination, and both should be able to follow their own conclusion if they wish. A curious point comes into the equation when a special payment is made to GPs for carrying out a procedure which is public policy. Infant vaccination has ceased to be public policy in general here; it would not be reasonable in those circumstances to argue that a doctor should receive an extra fee for following his inclination, or a parent's wishes, that the procedure should nevertheless be carried out.

Britain was the early home of the collaborative controlled field trial. The work done on the use of streptomycin in the treatment of tuberculosis and subsequently in determination of the optimal schedules for the use of the various anti-tuberculous drugs is an admirable example of the way in which progress can be made. The large-scale field trial of BCG is probably still the best evidence for the use of that vaccine produced in any country. An important factor is that the mounting of investigations of this kind should be seen to be independent of purely economic considerations. The profession is always suspicious that the NHS may promote particular methods simply because of their economy. It is reasonable, of course, that economy in the use of resources which particular methods may offer should be taken into account, as the demands upon the health service of the future will almost certainly always be greater than its capacity to meet them all. But, it has never been, and it is never likely to be, a feature of the health service that the decision about a new method would eventually be made simply upon economic grounds. There must be a balance.

At one time there seemed to be a possibility that the treatment of myocardial infarction might require regular use of anti-coagulants. If that had suddenly become the pattern of medical practice then laboratory facilities for undertaking coagulation-time tests would have been required generally. A service such as ours would have had to provide them. There was a possibility that a controlled study would produce that result and so a plan was made and steps were taken to ensure that it would be possible to meet a sudden increase in demand if the trial led to a general adoption of the method by doctors throughout the country. In the event, however,

The translation of scientific appraisal into practice

the large field trial did not produce evidence which justified a general change.

The economic factor can be persuasive in other circumstances. For instance, cytological examination of the cervix is believed by many doctors to be justifiable at much earlier ages than it has been the public policy in this country to promote under the NHS. The use of cervical cytology has not been put to a thorough examination by a large-scale controlled trial, but the practical fact is that examination of large number of younger women who are at less risk would reduce the chances of older women being investigated. In a country which has limited resources to apply to this work, this may well determine where such influences as the financial incentive to doctors may be applied. Thus, the NHS does provide the service for younger women if they and their doctors wish it, but does not encourage it by extra payments. This reluctance to extend the screening programme is incomprehensible to many, even in the medical profession, who think that some who could benefit are being denied an investigation which might save more lives.

Screening for carcinoma of the breast presents even greater problems. A large-scale controlled trial is in progress in New York, but a period of ten years may be needed for a firm answer. It has been decided that experimental investigations should begin in this country. Behind this, of course, there is uncertainty about the value of surgical or other treatment of cancer of the breast. For many years, radical mastectomy enjoyed a greater repute than all would accord it now. The combined use of limited mastectomy with or without radiotherapy may prove to give as good results with less mutilation. Such a conclusion can only be reached, however, by careful investigation of a large series, and the circumstances for a controlled trial of that kind are difficult to define and even more difficult to put into effect.

When one comes to the leading edge in some other fields of surgery, like transplantation, the position is no less complicated. In the relatively simple case of the procedure which perhaps was most widely adopted in this country at an early stage—transplantation of the cornea for the treatment of corneal opacity—simple demonstration that the cadaver cornea could be used to restore

The translation of scientific appraisal into practice

sight in suitable patients with a high proportion of successes, is sufficient in itself. A controlled trial would not be relevant. There must, however, be a serious examination of the interval within which eyes must be obtained in order to give a satisfactory result, and that requires comparison of results. It will certainly be better to use an eye which was taken within six hours after death than not to use any, but it may be better still to take the cornea from the eye which was removed within two hours.

Once the surgical technique of transplantation of the kidney had been fully worked out, again it was possible to show the benefits in the life to be lived by the individual with a successful transplant. It is then important to estimate the length of survival of the transplanted kidney and to study in detail the advantages of close tissue matching and the methods of handling the kidney before implantation in preserving a kidney which will function for a longer time. A recent report from the Transplant Society¹ has emphasized the need to improve methods of obtaining and handling kidneys for transplantation in Britain. Ambiguity in the law and professional apathy are serious obstacles.

In renal transplantation there is always the fall-back of intermittent haemodialysis. In heart transplantation there is no such fall-back position. The transplantation of the heart in fact determines that the patient will either die quickly or survive with a transplanted heart to live under conditions which seem to some, at the present time, hardly worth exposure to the surgical adventure involved. This is one way of looking at it; another is that even though many die early, a proportion of patients will have, literally, years of life preserved to them. The quality of that life is not something that is easily assessed in medical terms. The morbid process that made the patient's own heart defective may begin immediately in the transplanted heart. The heart which is transplanted must be taken from the donor at the time of death. There is always a possibility of argument as to whether the patient was in fact dead. There is intense popular interest in this kind of work, and much less in other kinds of assistance to the defective heart.

On the other hand, the surgery of coronary thrombosis gives room for the expenditure of a very large amount of surgical effort,

1. 'The shortage of organs for transplantation', *Br. med. J.* 1975, **1**, 251.

The translation of scientific appraisal into practice

and it really should be exposed to close examination by some kind of controlled trial before it is concluded that the benefits justify the expenditure of effort required. This may be a technical surgical achievement of which the surgeon could be justifiably proud, but it needs to be looked at with a longer view to determine whether, in a group of patients, the surgical achievement has really given a sufficient number of them greater benefits than they would have had by other means of treatment. It may prove that some of these operations are fully justifiable in themselves. But they may nevertheless involve the use of such large resources that the justification of such spending will have to be examined in relation to the situation of the service as a whole. It may be, as one ophthalmologist has commented, that we ought to consider first whether we have done all the operations for cataract and squint that we should have done, before we start using surgical resources to do more recondite and less certainly beneficial work for a smaller number of surgical patients.

Where new drugs or major changes of technique are involved it may be possible to undertake comparisons which will clearly demonstrate the advantages of new methods in the right hands. But much medical improvement is obtained by sedulous pursuit of improvements in method, perhaps mainly small changes, often by using methods of measurement which had not previously been applied. Twenty years ago the management of respiratory paralysis was revolutionized not only because the positive pressure method and better artificial respirators became available, but chiefly because it became possible to control the use of any respirator much more precisely by using new methods of estimating blood gases with apparatus which could be widely used.

Sometimes an epidemiological study will show a causative factor which had not been previously appreciated. Twenty years ago it was shown that the incidence of retrolental fibroplasia was directly related to the use of a high concentration of oxygen in the treatment of small premature babies. A change in method involving the use of lower concentrations was generally introduced forthwith in this country and in the United States. Cross has now pointed out that in both countries the change can be seen to have coincided with a check in the rapid fall in first day deaths which

The translation of scientific appraisal into practice

had been going on for some years and even to have been followed by a slight rise. If the reduction in early neonatal mortality which had been occurring before that had continued unimpeded we would by now have reached a much lower figure in this country than we have reached so far. The improvement that was resumed ten years later has not been sufficient to bring us to the point at which we might have been if the projections made by Cross prove to be accurate. We have a first day death-rate of 7 per thousand where Denmark, for instance, has a substantially lower figure; and it could be inferred from the previous rate of progress that we might have reached as low a figure as 4 per thousand. If this proves to be right, and we are not certain yet, we would have a clear example of an excessive reaction to one finding leading to an unexpected adverse effect which we should have detected sooner. We were not really sure of what we were doing because we were not then able to measure the blood gases in these small babies. I am really making the point that changes of technique in treatment need to be monitored by methods of measurement directly related to the clinical situation. The use of the very high oxygen concentrations which caused the eye damage to correct a subjectively judged clinical situation might have been avoided if monitoring of the hypoxia had been possible and its cause better understood.

There are other examples of changes which have been made because of epidemiological evidence such as those relating to the use of cyclamates, and the suspected dangers of mercury levels in fish for human consumption. It is now debatable whether the restrictions on use of cyclamate were justified. These were imposed on scientific arguments, apparently valid at the time, but they were not really related to sound epidemiological information. A very few observations suggesting the formation of bladder cancer in rats exposed to enormous intakes of cyclamate were linked to the knowledge that cyclo-hexylamine was a product of metabolism of cyclamate in rats and occasionally in man and a possible causal relationship was deduced. The possible effect of crystallization simply as a result of dosage was disregarded, as was the presence of saccharine. The De Laney clause in the relevant act left no choice in the USA; saccharine was an available alternative and the cost of playing safe was negligible. In the case of mercury in

The translation of scientific appraisal into practice

fish, calculated dietary intakes and body burdens were accepted without field checks to see if they were reached, and some countries hastened to impose a needless ban on fish taken from some waters. Britain was able to undertake a field survey, however, and avoided unnecessary restriction.

These examples are not so different from the earlier one of the oxygen used in premature baby incubators as might appear on first sight. In that case, it was assumed that levels of administration would produce certain results in the child without the ability at that time to check that they actually did so. All three examples show how change can be proposed as a result of an elaborate theory based on insufficient observation in the field, leading to conclusions about what will happen within the human body which have not been accurately checked.

It is often necessary to take these decisions against a background of public debate in which firm views are expressed by individuals who may be well versed in some of the scientific aspects, but not in the appraisal of epidemiological evidence. They have not the responsibility of decision-making and may be uninhibited in the utterance of conclusions which are likely to be widely reported in the press. The difficulty of disproving assertions thus made may not be understood by a public which naturally sees the problem in simple black or white terms. The death from an adverse reaction to measles vaccine which may occur once in half a million vaccinations is easier to comprehend than the fifty to a hundred deaths from measles, and the thousands of serious illnesses, that might otherwise have occurred in those half-million children and the others they might have infected. Some of the decisions, as in the use of vaccine, leave freedom of action to parent and doctor, but the decision on the permissible level of lead in petrol does not.

On the other hand, some policies based on general scientific principles can be allowed to drift too far, for lack of knowledge in depth. An example of uncontrolled drift in prophylaxis is that of the control of rickets in Britain. Between the wars a great effort in the child welfare services of local authorities persuaded most mothers of the advantage of dietary supplements of cod liver oil for babies and toddlers. By 1939 halibut liver oil and other preparations with high contents of vitamins A and D were coming

The translation of scientific appraisal into practice

into general use because they were more convenient. During the war free vitamin A, C, and D supplements were provided to protect children and expectant mothers from deficiencies as part of a Welfare Foods programme. The results were admirable, but dried milk was then required to be fortified to a minimum concentration of vitamin D. The process was simple and not too costly and levels tended to be far higher than the requirement. Other infant foods began to be fortified and advertised as such. The cod liver oil provided was not palatable to all babies and concentrates were often used giving a higher dose of vitamin D. All this reflected a general belief that more of a good thing is better. The original minima reflected the uncertainty of much knowledge about nutrition, with estimated requirements being doubled more or less for luck.

In the middle 1950s reports of cases of hypercalcaemia in infants began to appear, usually associated with a high intake of vitamin D. The Standing Medical Advisory Committee set up a sub-committee which obtained evidence that the general zeal for fortification of infant foods had greatly reduced the need for supplements. Average intakes were often far above requirements. Minimum levels of fortification were reduced and maxima were enforced. Advice on supplementation was sharply modified. We now know that prevention of rickets is successful but must not be overdone.

The vitamin C supplement through 'Welfare' orange juice had no risks. It ceased to be so necessary, because the general dietary available from other sources was sufficient, long before the supplement was cut down. The delay, at considerable cost to the service, was due to the success of earlier persuasion of mothers of its virtues.

The most notorious of the decisions by public opinion is that on fluoridation of water. It has been the result of the honest, determined, but misinformed advocacy of a small group diligently presented to many local authority members. It has preserved no one from harm and it has inflicted dental injury on millions of our children. But it is surely better to have this freedom of public debate than to be subject to an autocratic power, which is not infallible, enforcing medical conclusions.

The translation of scientific appraisal into practice

My purpose in this chapter has been to show the problem of making the right generalizations at the right time. Scientific calculation of the possible result *in vivo* should be checked by field observation wherever that is practicable. It is not enough for a particular scientific investigating team to achieve a particular result; it must be possible for that result to be generally known so that others can apply it. Generalization of knowledge, so that doctors may then of their own volition accept modification of practice, has to be contrived; it requires deliberate action for it will not always happen of itself.

3

The response to advance in medical science

Lord Rosenheim, when speaking at the commemorative session held by the European Regional Committee of the World Health Organization at Varna in Bulgaria in 1968 said that remarkable advances could be achieved in the next twenty years simply by applying completely what we already knew. When he made that comment, apt as it was, he was emphasizing one of the major and increasing problems of medicine today. I believe he was thinking particularly of the way in which the individual physician uses the knowledge, which accumulates at an ever-increasing pace, and about the methods we use to diffuse that knowledge generally within the profession. It is, of course, a commonplace that medical knowledge has advanced at such speed, and that the application of science in medicine has become so complex, that no one doctor, however high the quality of his mind, can possibly have a comprehensive knowledge of medicine as it is today. Medical knowledge is more systematized and, therefore, some kind of skeleton can be comprehended by the individual. But that is a far cry from an individual being able to utilize the full fruits of medical knowledge for the benefit of his patients. It follows that effective dissemination of new information to all active clinicians must be an objective of the profession, of the medical schools, and of those responsible for organized health services in all countries. It must also be accepted that the isolated doctor will be a bad doctor unless he has such links with others possessed of a different pattern of medical knowledge and skills that he can use them.

Not only does medical and scientific knowledge accumulate evermore rapidly, but the frame of reference developed by the medical student, which makes his knowledge coherent and intelligible and capable of extension in later professional life, will need to be modified during that life. This is much more difficult

The response to advance in medical science

than the mere extension of knowledge within an existing frame of reference. A new understanding of some medical problem has to be capable of an intelligible relation to the knowledge he is already using, if an individual is to be able to come to terms with it and exploit its possibilities fully. The potential of chemotherapy or immunotherapy in the malignant diseases, for example, will only be realized if their possibilities are understood by those who need to refer suitable patients at the right time. An entirely strange phenomenon like the use of acupuncture in anaesthesia, on the other hand, may be dismissed by some as a manifestation of hypnotism or even a deliberate fraud, yet employed by others as if it were a kind of magic. The average doctor, if he is to accept that new methods may be effective in given circumstances, must have some frame of reference within which they seem to fit.

Two of the greatest changes in medicine in the 1920s were the introduction of insulin for the treatment of diabetes and of liver extract for the treatment of macrocytic anaemia. In both cases it was relatively simple to understand the nature of the replacement therapy involved. The preparations that were used were fairly soon refined to a level at which they could be safely administered by doctors other than the specialist although, in the earliest times, for economy and for safe use, it was necessary that at least the use of insulin should be in the hands of people best able to appreciate its benefits and risks. In both cases it was necessary for the pharmaceutical industry to develop rapidly methods of producing the active substances involved and of standardizing their preparations so that predictable therapeutic results could be achieved. Once this had been done, although laboratory checks and specialist oversight may still have been needed, it soon became practicable for the GP to use both remedies successfully and safely for the patient. Even then the spread of understanding took some time, and eight years after Minot and Murphy's work I was charged as a junior hospital doctor with the maintenance injections of liver extract which GPs in East London were thought not to understand. That was further emphasized for me within a few months when, assisting a good GP, I found that he believed that a patient whose macrocytic anaemia had been treated in hospital till the blood picture was normal had been cured. I repeat that he was a good

The response to advance in medical science

doctor, but he had a year's *British Medical Journals* still wrapped in his surgery. His sound clinical sense kept him out of various clinical pitfalls into which, with my new MRCP, I tumbled incontinently during the next year. But it would help him less now, when so many potent therapeutic agents are available and must be used with full understanding and close control.

Later, when the anti-bacterial drugs, first the sulphonamides and then the early antibiotics, became available, it was relatively easy and safe for doctors generally to use them, once they had learned the principles involved. Yet as a VD officer ordering sulphonamides for the first time in 1938 I was questioned by County Hall on my reasons for seeking to use a dangerous drug for the treatment of gonorrhoea. It is true that harm could be done by indiscriminate use of antibiotics in a way which could lead to the development of resistant strains of organisms, but general application fairly soon became an accomplished fact. Since that time, of course, complicated teamwork and continuous control have become necessary in the use of some other drugs or medical techniques. But the use of a particular remedy by an individual doctor for an individual patient using only some modest assistance from the laboratory is entirely practicable in many cases.

There still occur examples of the kind of change which can be adopted widely by many doctors without a great deal of preliminary preparation. When cortisone first became available, the safe limits of its use had to be defined by specialist teams working with the advantages of the scientific assessment available in selected hospitals. The shortage of supply and the high cost also made it necessary to limit the work in this way in the early days. When some of the oral diuretics became available the position was very different. Methods of using them, developed at hospital centres and described in publication, could be applied immediately by doctors working away from such centres, and considerable benefits for many patients so obtained. The most recent example of a major change of this kind is the use of L-dopa in the treatment of Parkinson's disease. Supplies in both these instances were soon so large that it would only have been possible to limit the use of such drugs to hospital if there had been a real case on safety grounds; and there was not.

The response to advance in medical science

We have certainly failed to do enough to secure improvement in ordinary daily use of drugs. The number of new drugs becoming available each year may be of the order of forty or more new substances and twelve times as many new formulations. Knowledge of their use is of great importance to all in general and hospital practice. It is quite impossible to continue in practice long with the information on pharmacology and therapeutics given to the student in his undergraduate career. Even by the time he is trained for any special branch of medicine or for general practice there will have been substantial changes since he qualified in the drugs available for his use. Even within specialist branches it is highly unlikely that all can keep in touch with the latest information about drugs over quite a narrow field. The number of admissions to hospital for treatment for adverse reactions to drugs now exceeds 100,000 a year, not just because of doctors' ignorance, but because safety margins are less.

We already have at the national level a poisons centre which is a source of information for people working in hospitals anywhere, and there is a similar centre in Scotland. But the need for information about poisons or of adverse effects of drugs taken perhaps in overdose, is only part of the requirement. Cochrane in his monograph pointed out how widely misused some vitamin preparations are. O. L. Wade has pointed out how often chloramphenicol was still misused in general practice twenty years after its potential for harm to the haemopoietic system had been demonstrated.

The development of clinical pharmacology and therapeutics was always more seriously considered in Scotland than in most of England. There are now a number of chairs of clinical pharmacology at English medical schools and it is to be expected that in the near future all schools will have chairs in that subject; but the presence of chairs in medical schools is not enough. The district unit which is the basis of the British NHS could be used as a means of ensuring that in every district there is within the specialist team someone who is either a clinical pharmacologist or a physician with a special interest in the use of drugs. Such an individual should take a large part in the postgraduate education system of the district in which he works, because his impact will be at least as much through what he enables others to do as through

The response to advance in medical science

what he does himself. The part played by specialists who do not themselves have direct charge of all the patients with whose diagnosis and treatment they are concerned has progressively increased. The pathologist, the radiologist, the clinical physiologist, the neuro-electrophysiologist are all established already. The clinical pharmacologist becomes more important as the potency of drugs increases. Both the World Health Organization and the Royal College of Physicians have emphasized this.

The main channels for dissemination of medical knowledge are the ordinary literature of medicine. The number of medical journals now available in the English language runs into thousands. No person could read them all, and some are so highly specialized that only people working in the particular field would want to read them. There are means of analysing what is reported. The computerized Medlars system based on Washington and the Cumulative Index Medicus before it, for instance, have been major contributors to this sort of analysis. It is now much easier than before to gain access to the information available in the world's medical literature about any particular development and to have it in a considerable degree of subdivision. Even so, the volume of information is so large that it may be very difficult for the individual to have access to all that is available in his own field. A large proportion of the world's medical literature is either published in the English language or available in translation (at least in abstract). The language problem is a greater obstacle in some countries, however, and the extent of dissemination accordingly is less.

Mere access to the printed word is not sufficient. The generalization of knowledge which is necessary for some kinds of change will not be achieved in that way because not everyone is able to acquire knowledge in sufficient volume or sufficient detail merely by reading. This is particularly true of doctors in general practice, because the individual there may need to have his attention called to certain aspects of quite specialized medical information which may not be published in the kind of journal which he normally uses. Some of our journals do attempt to review fields systematically so as to assist the average doctor to maintain some contact with knowledge which may be useful to him though peripheral to

The response to advance in medical science

his main interest. Even that may not bring certain things to his notice with sufficient emphasis.

The research centres in the USSR, which I have already mentioned, were established with the idea that they might become the centres from which accurate and specialized knowledge in any field could be disseminated generally. That system may lead to an authoritarian presentation of information that would certainly be unacceptable in this country. In any country such canalization into official channels may lead to a rigidity in the development of medicine, to the promulgation of views which are sometimes incorrect, and to a kind of automatism in medical practice that seems highly undesirable from the patient's point of view. It might be thought that this is not so very different from the use of computer systems as an aid to diagnosis and treatment such as are now being developed in this and other countries. That need not be so, provided the final decision rests with the individual clinician. Nor should clinicians feel that the use of assistance of this kind in the medical world, which is saturated with so much information that no one can master it all, should be avoided.

Obviously a system of on-going education is a necessity in medicine today. The need for specialized systems of vocational training and for vocational training for general practice has been generally accepted and on-going education for general practitioners is a factor in remuneration. In the specialties it is probable that too much reliance is still placed on the kind of contact that occurs in ordinary hospital work and through specialist associations for maintaining the refreshment of knowledge that all need. In the early days of the NHS, arrangements were made to allow for study leave and fifteen years later these were considerably liberalized, particularly for younger doctors.

It may well be that the profession and the service should consider not so much why some people go so often on study leave or seek to do so, but why some of them never seek to go at all. It should be a matter of real concern to a specialist division in a hospital group if any of its members seem not to go outside the group itself in order to obtain further knowledge. In future, it will probably be more common for specialists to do most of their work at one or at most two or three hospitals. Although this

The response to advance in medical science

arrangement is of advantage as a means of making the most efficient use of their time, it is not without its dangers if it limits the range of their specialist contacts.

It is generally accepted now that continuing education is essential to a doctor whatever his field of practice, whether it be clinical or administrative. He can no longer expect to attach unassisted all the newly reported information to the system which he is already using. If, therefore, he is to keep practice in his own field up to date he must have the new knowledge made available to him in readily assimilable form. He should not simply be presented with new information and left to systematize it all for himself. A man may be expected to make his own adjustments in his particular field, because he understands in greater depth the nature of the framework that he is using. But he needs much other knowledge and, most of all, he needs assistance in adjusting his frame of reference continuously so that he may associate correctly useful knowledge from other fields with his accumulated knowledge. Perhaps this gives its greatest importance to the recent development of postgraduate centres in Britain.

The defects in vocational training for various special fields of medical practice, were perhaps most clearly apparent to us at the time of the Oxford conference of 1961. The forward surge in postgraduate medical education since that time is one of the most important new developments since the health service was introduced. It potentiates all the others. It has been said by some people that the emphasis of the postgraduate medical institutes is predominantly on general practice. It is true that developments since 1961 have been mainly influenced by the greater need in general practice but, as can be clearly seen by any who go to those centres, continuing education is enjoyed as much by hospital staff as by those who work outside. Moreover, much of the more specialized vocational training is best organized on a larger scale and concentrated on a small number of the centres, facilitated by day-release schemes and the like.

We are reminded from time to time that much postgraduate medical education has still to be evaluated and we certainly cannot claim virtue simply because of its amount. It varies considerably from district to district. The work of some postgraduate centres

The response to advance in medical science

may be too heavily taken up with rather esoteric subjects, or the display of particular interests of individuals whether working locally or invited from special centres. What can be done is very much dependent, of course, on the enthusiasm and competence of local individuals who play a major part in the centre. That contribution should be recognized as outstanding in the work of the profession as a whole in the last fifteen years.

The need for the improvements which have been made in post-graduate medical education arose inevitably from the advance of medicine. The method of identifying and satisfying that need may have been contrived but, had that contrivance not been effected, the state of medicine in Britain would today be far worse than it now is. Further improvements will now be made and, in our future health service organization, it is manifest that the post-graduate centre will play an increasingly important part in aiding dissemination of medical knowledge. Doctors who work in hospital and doctors who work in the community have the opportunity of meeting there and exchanging information of a technical medical kind, and contributing their several pieces to the understanding of the health service needs of the population of that district.

The community physician also has his part to play in securing the benefits of advances in medical science. His function has never been seen as that of putting the right thoughts into the minds of all his clinical colleagues. No doctor could have the breadth or depth of professional knowledge to do that sort of thing, nor would it be acceptable if he had. But there is a community need at district level which must surely be made clear. The real function of the community physician will be to assist his clinical colleagues in using the opportunity of examining the needs of the public they serve; and in trying to adjust their methods of working, as well as their scientific practices, to meet those needs. There will never be all the resources of men, materials, or money to provide everything that could conceivably be done. We must make a balanced use of what resources we have in the interests of the public we serve, and try to get for them the best that available resources can provide.

Doctors are not trained to spend their lives as questioning

The response to advance in medical science

scientists with ever-open minds, but to act more often as pragmatists in situations changing before their eyes and requiring action within a short time lest an opportunity for the patient is irretrievably lost. They are not the only people who lead such lives, but rapidly advancing medical science makes the bases of their decisions less durable than those employed by most others. The nature of the responsibility, involving decisions about the lives of others, makes any practitioner anxious to have the support of a settled body of professional doctrine applicable to the problem before him. He cannot be expected to think forward from first principles every time. The result is that the profession, most of whose members are well over 30 before career establishment, tends to be cautious about change. Within a health service where deployment of resources affects the availability of any new development, that caution may be exaggerated. The public, rightly, would prefer a profession which is not too adventurous in exposing patients to relatively uncertain consequences, but that same caution can in another context slow down desirable changes. The NHS needs to provide opportunity for the professions to adopt and promote changes in professional method and organization at the optimum time.

4

The growth of specialization

In the 1920s and 1930s advance in medicine was beginning to require the development of specialization, and specialization proceeded at its greatest speed immediately after the last war. The NHS helped to accelerate this development in Britain but it was not the origin of it. The NHS machinery did make practicable the sharp division which occurred in Britain between the specialist and the generalist. Indeed in many other countries the borderline is still far less sharply defined than here. This too has been criticized, for instance by those who say that it is quite impossible for a doctor to use up-to-date methods unless he has the resources of a hospital available to him. Others say that the interest of practice without hospital facilities is not such as to attract doctors of good quality. I believe that both these views are incorrect. They both derive from failure to appreciate what constraints the modern changes in medicine place upon the span of effective control by the individual.

Continuity of care becomes steadily more important as medicine is concerned less with short, infective, self-limiting episodes and more with support through longer, possibly lifelong, disabilities. In the latter the episodic contributions of specialists are effective only in so far as they fit into related, continuing care given by the generalist. Rorie some years ago reporting on a travelling fellowship he held as a GP in North America, commented that relationships between GPs and specialists in North America were far less easy than in this country. He attributed the relatively free relationships which we now enjoy to the fact that neither the GP nor the specialist sees the other as a competitor and therefore the two are able to work freely together without fear of loss of patients. This is not solely a matter of the possible monetary advantages even in North America. It is much more the outcome of recognition here that the care of a community requires both the skills of those working in depth in a narrower field in the hospital

The growth of specialization

context and those working in less depth, but over a wider field in the community. Mere narrowing of the field of practice is not a virtue in itself, but a means to an end. Responsibility has to be shared.

It may be that perpetuation in the NHS of a pattern of general practice which had already become well-established under the earlier national health insurance system produced some benefits accidentally. It certainly promised economy in a costly service such as would have obvious attractions for a government faced with the very heavy expenditure involved. It certainly provided a screen, but not a barrier, which holds back for management in general practice what can and should be managed there; and lets through to the hospital, or actually sends earlier to the hospital, only those patients who need the resources deployed there. This has prevented the hospitals from being swamped by the sheer weight of demand, which has proved so exacting in many other countries where no such screen exists.

The number of patients seen by GPs in the course of a year is several times greater than the number of out-patients and in-patients seen by hospital medical staff. In the course of a week, the number of patients consulting in a hospital is probably not more than a quarter of the number of patients who consult their GPs. The pattern of care is different in, say, Sweden or the USA where established hospital medical staff far outnumber GPs. For example, there are as many general and orthopaedic surgeons together as GPs in the USA, whereas here the ratio is less than one to fourteen.

Over the past twenty-five years there have been considerable changes in the number and deployment of doctors and health service staff generally, and in their pattern of work. The number of GPs has increased by just over one-fifth, but the number of consultants has more than doubled. The number of doctors in training, working in support of consultants, has also doubled so that the ratio of hospital staff to GPs has greatly increased. There have also been great increases in the numbers of trained nurses and midwives employed in the NHS. But perhaps the most striking feature of all has been the increase in numbers of scientists, members of professions associated with medicine, and technologists of many kinds.

The number of specialties in which consultants work has

The growth of specialization

doubled since 1948 and much of the increase in consultant numbers has been in the new smaller specialties such as urology, geriatrics, and plastic or thoracic surgery; in scientific supporting services; and in collaborating services like anaesthesiology. Among the large clinical service specialties, only gynaecology, traumatic and orthopaedic surgery, and psychiatry show comparable growth.

These developments in hospital staffing have resulted in a great increase in hospital in-patient work. The number of admissions has nearly doubled in twenty-five years, while the number of hospital beds in use has steadily declined. The substantial reduction in average length of stay that this reflects has only been made possible by major changes in the pattern of hospital work to which I refer in later chapters. There has also been a growth in out-patient work which has been largely the result of an increase in, and ageing of, population; of an increase in antenatal work; of an increase in trauma requiring treatment; and of increase in psychiatric out-patient consultations.

Much more work is done in hospitals and its complexity requires far closer teamwork in medicine than has ever been necessary before. The growing complexity in hospital medical work also affects the needs of general practice. It becomes more than ever necessary that there should be good communication and, more importantly, good understanding between doctors giving primary and continuing care outside hospital and those engaged individually and collectively in the care of those patients from the community who at a particular time need hospital care.

THE SUBDIVISION OF SPECIALTIES

Only twenty specialties were listed in the first hospital returns to the department. Forty are listed in the statistical summary now, the latest addition to these, that of immunopathology in very small numbers. But, whereas twenty-five years ago it was sufficient to list pathologists as one group, they are now shown under seven different heads. Although the number of specialties recorded separately has doubled in twenty-five years, we still have only about two-thirds the number of specialties recognized in for instance the USSR or the USA.

The growth of specialization

The distribution of specialists so that in every district there is now a complete specialist team locally available or accessible has been an enormous gain to the public and to our health services as a whole. It has its dangers also. When the original memorandum on development of specialist services which was then called RHB (48) 1¹ was distributed at the beginning of 1948 it contained the views on the development of the specialties of a group of senior consultants. They had met at the Ministry under the chairmanship of Sir John Charles, author of the first Rock Carling monograph, during the previous three years. The memorandum was generally found acceptable, at the time, but of course is now far out of date.

In 1948 there was a completely new task before hospital authorities who had no previous experience in the field. I recall a conversation in which an administrative colleague described the first circular to hospital authorities as their gospel, to which Sir John Charles replied that his group was writing the epistles. The comparison is not inapt but the exercise was not repeated. The Cogwheel working party made an attempt to revise it, but did not carry through an exercise which is now far more complex and less certainly of value. Indeed things now change so rapidly that it is improbable that an exercise of this kind could ever be really up to date. In future, the specialty associations, the Royal Colleges and the Council for Postgraduate Medical Education should be a better guarantee of the kind of development that is needed, if they promote the direct personal and regional exchanges that are necessary. But they will need co-ordination and I should hope to see that come spontaneously from within the profession rather than by a new departmental intervention. That will not happen unless the professional organizations allow their younger members to play a larger part than in the past, as the Trust has recently done.²

It cannot be said that the increase in specialization was actively encouraged by all senior consultants. It is certain that the advantages to the patient of reference to a specialist in a narrow field are not always accepted as such. We were slow to see the benefits of centralizing the intensive treatment of leukaemia by chemotherapy.

1. Ministry of Health, *The Development of Consultant Services* (London: HMSO, 1948, revised 1951).

2. *Specialized Futures* (London: Oxford University Press for the Nuffield Provincial Hospitals Trust, 1975).

The growth of specialization

The need for a paediatric surgical unit in every region was not accepted until recently, although there can be no doubt that surgery in the neonate, if it must be undertaken, is best undertaken by teams specially experienced in the work. For a long time, half the paediatric surgeons in Great Britain were working in Scotland where consultant staffs were larger. Even in neurology there was a long struggle to develop regional units and there are not sufficient of them now. Conservatism within the specialties can prevent the developments which could give the best results.

Further development is needed, but it cannot be centrally imposed. The central department cannot have the perception and should not have the authority to decide that professional work should be further subdivided in a particular way. Since it is for the profession to do this, then the profession should be more widely aware of the need for such changes. Very often the younger men are only too well aware of the progress required. It has sometimes happened that new techniques are used and developed largely by younger men. They may then be kept at senior registrar level for long periods because of their special contribution when this should, in fact, bring about their earlier advancement to consultant level. Sometimes the development takes place in an academic unit, where someone develops the capacity to undertake a particular kind of work. If he eventually goes to some other academic post his loss is immediately felt. Too often one is told that there is no room for an additional consultant through lack of beds. The fact is that the ratio of 'beds' to 'consultants' is now a great deal less than half the ratio in general hospitals twenty-five years ago, and it will dwindle further. As I have already mentioned, more work is now done using a smaller number of hospital beds, and that means that this resource has to be shared between a larger, and growing, number of consultants.

There is really only one way of dealing with this situation. The introduction of divisional organization in hospitals after the first Cogwheel report began slowly but has now become almost general. With the kind of subdivision that has been going on and is still continuing a division of general surgery, for instance, will be increasingly composed of people with special interests. The kind of selection made by GPs in referring patients to their

The growth of specialization

specialist colleagues has recognized this for long enough, but it may now have to be given a more definite shape. A division accepts a collective responsibility for providing clinical services of a particular kind to the population of the district in which the division works. If a satisfactory range of services is to be provided, it is not sufficient for the composition of that division to be left to chance. The degree of subspecialization that occurs among members of a division is no doubt often reflected in the selection of successors, but this is not always planned as deliberately as it might be.

This is a matter with which regional and area health authorities will need to be particularly concerned in future. They have a complex responsibility in ensuring that the clinical range available in every district is sufficient to the district's needs. This will call for a close interrelationship between the divisions and GPs at the district level and the medical advisory machinery at regional level.

The third Cogwheel report referred specifically to the need for associations outside the ordinary divisions of a particular hospital group. The most obvious advantages are obtained in providing for exchanges covering the common interest of, say, the cardiologists, the cardiac surgeons, some of the radiologists, and the cardio-respiratory physiologists in a region. They contribute to a common pool of knowledge and have a common object in supporting the whole of the services for those suffering from heart disease in the region. Recently in the south-eastern region some paediatricians have considered the advantages which might be derived from forming, as it were, a regional section of paediatrics which, systematically used and guided, could be a valuable adjunct to the local specialist division. It is important that specialization should not be allowed to impose exclusiveness and greater rigidity, so as to impede interdisciplinary communication, as it could well do.

The application of new advances in medicine has now to be organized on a larger scale than could be open to the individual doctor working in hospital or in practice outside it. Many of these developments, if they are to become generalized, require action on a regional or national scale. It is of the nature of a health service such as ours that any new development which gives benefit to the individual patient, must be available to all if it is shown to be of advantage to any.

Change in general practice

When most GPs were single-handed and most specialists worked with a house officer and little if any other help, medicine was a more simple affair and could be managed as an individual activity without recourse to the help of many others. Change occurred slowly and depended entirely on the individual who did not need to carry a group of colleagues working in the same field with him. In no form of practice does that situation still obtain. Democedes,¹ when he was paid one talent a year by the people of Aegina and later two talents by Samos 2,500 years ago, could do as much for them unaided as by any combination of physicians of his day. Dr. Lettsom working alone two hundred years ago could probably do rather more for his 'panel', but neither has a spiritual heir today.

In 1948 there was no apparent need to define general practice, but specialists or consultants, as they soon came to be called by their own wish, were defined by reference to the work they did in hospital. The abrupt completion of the separation between general and specialist practice soon brought the need to define the role and future of the GP. The Danckwerts adjudication in 1952 and its acceptance by government remedied the unsatisfactory settlement of remuneration in 1948. But that did not satisfy the need of GPs for a redefinition of their futures in other terms. The foundation of the College of General Practice occurred at a time when one harshly critical report by Collings and two more constructive reports by Hadfield and Taylor had clearly revealed the need for reform. The College provided a forum and became a potent influence for the improvement of general practice just when it was most needed.

Various definitions of general practice have been offered and I shall not propound a new one. The central components of general practice work are surely initial diagnosis and primary care, sometimes leading to reference to a specialist colleague; continuing

1. Herodotus, *The Histories*, Book 3.

Change in general practice

care, whether or not some part of an episode has involved specialist participation; and selective preventive work, which may include increasing use of screening procedures.

The control or prevention of many acute infective episodes leaves an ageing population in need of more and more attention to chronic and degenerative conditions for which prolonged hospital care is now less common. The development of new drugs which can be used to control some aspects of chronic illness has made it possible for the practitioner to give continuing support to patients at home. The tempo of general practice has, therefore, changed and, save for epidemics of influenza, the load is more predictable and less seasonal.

The general social pattern has changed and the reasonable expectation of the GP to share in that change must be accepted. Practice can now be organized in such a way as to distribute the individual's work by appointment systems and to enable him to have adequate relief from the continuing commitments by deputizing arrangements. Night calls are now infrequent. Absence from the practice for the purpose of postgraduate education has become not so much a privilege as an obligation. The distinctive contribution that nurses, health visitors, and midwives make to care of patients in the home is increasingly arranged, as it should be, in close collaboration with doctors.

Continuity of care is a distinguishing feature of British general practice and it is inevitable, therefore, that doctors should seek organized group practice even more in the interest of patients than of themselves. In general practice, partnership and later grouping have been promoted by other incentives as well as medical advantages. There are financial benefits in partnership, including the possibility of sharing premises and other assets of the practice, with the advantage in many cases of working in purpose-built premises. There is also the possibility of a smoother transfer for the retiring man and the careful acquisition of an acceptable successor to him by the partners who remain. Doctors in a larger group can more readily arrange to cover holiday absences, sickness, and time off than can single-handed doctors. Group practice also makes it easier to arrange for health visitors and home nurses to work with practice populations rather than having geographical areas, in

Change in general practice

which many doctors work, allotted to them. The benefits of such a doctor/nurse partnership in general practice for both the doctor and the nurse are beyond dispute, but the single-handed practice is much less easily linked with community nurses in this way.

The first real stimulus to the development of group practice came after the Danckwerts¹ award. A generous settlement made it possible for the doctors to decide that the advantages to general practice as a whole of setting aside £100,000 a year from the 'remuneration pool' to assist the establishment of group practices outweighed the small loss in individual remuneration. The BMA's GMS Committee seldom receives the credit it deserves for this progressive act.² The Royal Commission on Medical and Dental Remuneration was later to point out the anomaly of drawing funds for this purpose from monies intended for doctors' remuneration. The Royal Commission recommended instead that Exchequer funds should be made available for the purpose. In all, the fund from which interest-free loans were granted reached £800,000 and gave help to some seven hundred practices. This step led to one of the more decisive changes in medical organization since 1948 and it was achieved as an apparently minor by-product of a general negotiated settlement of remuneration.

The provision of accommodation in health centres for GPs and preventive health services was the logical next step. But this step could not be taken until the settlement on the 'general practitioners' charter' fourteen years later removed another anomaly, whereby the notional rent for individual practice premises owned by a doctor was excluded from the computation of the practice expenses refundable to him and a general average was used. This penalized the GP who provided good facilities for patient care to the advantage of the practitioner who failed to do so.

It should be remembered that the original system of GP remuneration through the pool was something to which the profession was passionately attached at the beginning of the health service, and it was of course an economical arrangement for the Government. It did come to penalize the best forms of general

1. Memorandum on the Supplementary Estimates (London: HMSO, 1952, Cmd. 8599).

2. (London: HMSO, 1960, Cmd 939).

Change in general practice

practice, however, and this led to great dissatisfaction. The general practitioners' charter followed negotiations in which the Minister, Mr Kenneth Robinson, personally took the chair at nearly all the meetings. It was a major effort by the health departments and the profession jointly to remove the grounds for the dissatisfaction that had arisen. The decisions looked as if they gave a considerable financial advantage to GPs compared with their previous condition, but the main point was that they provided, for the first time, a background against which a rational system of organization of general practice could develop.

The general practitioners' charter was not expected to give a great stimulus to the provision of health centres; but it did. From then on, this most promising method of providing the facilities for general practice has been adopted on a rapidly increasing scale. The advantages seem so obvious now that it is difficult to understand the genuine fears which led doctors to ignore the health centre opportunity for the first fifteen years of the NHS. But these fears were real and were still being expressed at BMA annual meetings into the late 1960s. This reaction should not be dismissed as mere obstruction. Some good doctors genuinely feared loss of clinical freedom and all could see the unfairness of the financial arrangements. The system had to be made demonstrably fair to the doctors and nurses and also to be acceptable to the public.

In the first fifteen years of the NHS only seventeen health centres were opened. From 1964 on, the rate of building of health centres increased progressively until at the present time a hundred or more are being opened in England each year. Indeed the demand during 1973-4 for the first time outstripped the financial provision that could be made to meet it. At the same time, the arrangements under which nursing staff of local health authorities work from the base of general practice advanced rapidly. As a result of all these factors, we had evolved the opportunity for real progress in general practice. This change deserves to be ranked with the great improvement in provision for postgraduate medical education, which began a few years earlier, and the development of specialist hospital staff in the first decade of the NHS as providing the opportunity for major improvement in the health service. Taken together these changes give us now a situation at

Change in general practice

district level capable of being developed to meet future needs: the development of specialist services based on the district general hospital, the development of group practice in health centres and, binding the two, the further evolution of postgraduate medical education based upon a centre located at each district hospital. Each of these developments follows logically from the original organization of specialist services in every district, distinct from, but working with general practice.

There are still some 3,700 out of 9,000 practices consisting of only one principal. That represents 18·5 per cent of principals in England, compared with 26 per cent ten years earlier. Some of those doctors are working in health centres though not in partnership; they therefore have many of the advantages of group practice. Some of the doctors who are in partnerships are not necessarily obtaining the full advantages of grouping, but some three-quarters of all principals do satisfy the requirements for the extra allowance for practice in a group. There is a considerable geographical variation which is not determined simply by the degree of urbanization. The south-east and north-west, both with predominantly urban populations are the only regions with just over 30 per cent of single-handed principals while the most rural region, East Anglia, has only 15 per cent.

There are conflicting interests both for doctors and patients. Some people still hanker for the old arrangement of a single-handed doctor, always the same and always available. Some doctors like to feel completely independent; personality problems can always occur in a group. But the professional arguments unquestionably favour grouping for efficiency, economy, and convenience. Now that the doctor/nurse/midwife group with secretarial and receptionist help has been generally adopted, one can no longer think in terms of the old one to one situation. The necessity of on-going education is an added argument. Whatever might be lost in continuity and convenience for patients can be minimized by suitable organization. Planned use of the doctor's time through an appointment system and suitable arrangements for deputizing can keep the continuity with individual patients and meet the patient's own convenience.

Continuity of care through general practice is one of the most

Change in general practice

important assets of the NHS. Other countries which have kept a form of general practice have not all succeeded in maintaining continuity to the same extent. In Copenhagen a separate night deputizing service has been in use for more than twenty years. In Sweden half the first medical contacts in any episode of illness are with hospital staff in out-patient departments. In the polyclinic practice of the USSR the *uchastok* doctor has set working hours and in any case a patient arriving at the polyclinic may go straight to a specialist. In Britain independent deputizing services have grown rapidly in recent years, but they operate as the agents of the practitioners and within narrow limits. In 1972 Williams and Knowelden¹ estimated that 28.3 per cent of doctors in England and Wales were using these services, ranging from none in East Anglia to 60 per cent in Greater London. Nevertheless the General Practice Working Party² estimated that the services undertook only one-third of 1 per cent of the consultations in general practice. Of course there are many other deputizing arrangements between doctors, of which the model most favoured by the Working Party was that in operation at the Woodside Health Centre, Glasgow, where the work is shared amongst the doctors with one on duty every night and two at weekends.

It is not possible to contemplate going back to the old system of unrelieved continuous responsibility and deputizing arrangements are unavoidable. Nevertheless the commercial schemes which may employ doctors without previous experience of general practice are much less in conformity with ideal general practice than arrangements like those at Woodside. One hopes to see deputizing arrangements completely under the control of the doctors using them and carried out by doctors with at least the vocational training now recognized as needed for general practice.

Appointment systems have a longer history than the deputizing services. They have become widely used, probably now by two-thirds of all principals. They make it possible to pace the doctor's work over the day and reduce the waiting time for patients. At the same time doctors have been reducing the amount of time spent in late evening surgeries which were primarily a convenience for

1. Williams, B. T. and Knowelden, J. 1974. *Br. med. J.* 1, 9-12.

2. *Report of the Joint Working Party on General Practice* (London: HMSO, 1974).

Change in general practice

patients and in no sense a medical need. The changing pattern of disease treated in general practice has lent itself to this change as has the declining need for home visits. It is to be hoped that general practice will never be so changed that home visits lose their place in the continuity of care, but it is true that a surgery appointment will now meet a much higher proportion of the needs of patients than even twenty years ago. The Working Party believed that the advantages of a good appointment system for both doctors and patients outweighed any possible disadvantages, but they thought that the way in which they operated must be kept under close review. There is always the risk that a system can become a real impediment to the communication between doctors and their patients that it should be designed to improve.

The organization of general practice has become one of the more important areas of medical development. Continuity of care will only be maintained in future if this is accepted as one of the prime objectives. More than most other medical activities, this is the guarantee of humanity in the NHS.

This important subject was fully discussed in last year's monograph by Harry Harris which should be read by everyone concerned with preventive medicine.

6

Change in preventive medicine

COMMUNICABLE DISEASE

The older environmental preventive measures have become so firmly established that medical involvement in them is now small. Yet medical appreciation of them must be maintained. Work that was the main preoccupation of medical officers of health at the turn of the century has become the routine preoccupation of others in housing, architectural, and engineering departments of local authorities or of regional water undertakings. Even field epidemiology of some of the communicable infections is a more familiar exercise to some staff of the Public Health Laboratory Service. Yet it was the MOHs of county districts in Yorkshire, Essex, and Bedfordshire who unravelled the mystery of typhoid infection from canned meat. Two outbreaks of poisoning from bread made with flour contaminated in transit by pesticide leaked from a defective container would have baffled everyone but for the perspicacity of the MOHs concerned. Control of smallpox, should it ever be required again in Britain, will depend on the man on the spot. The district community physician will be chiefly concerned with other problems, but a regionally based expert will be ineffective unless he works with and through him as the man with local knowledge.

If in the medical profession we look realistically at the prospects of improved prevention, we should surely seek more complete use of some of the proven methods of prevention we have now. Primary prevention of communicable disease has been the great medical success of the last 25 years. We may yet see part of that success undermined by the reduction of confidence in immunization against whooping cough—there was an appreciable increase in this disease in 1974 which may reflect declining use of vaccine—and little medical effort has been put into improving the whooping cough vaccine. This particular vaccine is less certainly effective and more prone to side effects than, say, poliomyelitis vaccine. It should have been improved and made less likely to cause reactions.

Change in preventive medicine

Its value has not been disproved, and most developed countries use it. However the real shortfall in the vaccination programme is in the use of vaccines of unquestioned value. The major cities as a group fall far behind the counties in the completeness of their programmes.

One of the more frequent comments about the NHS is that it is really a national illness service, and that it would be more effective if more was spent on prevention and primary care. We probably do spend a larger proportion of our health budget on primary care than any other national health service but, if we are to spend a great deal more on prevention, one must ask on what forms of prevention. We do not use fully preventive methods we have available now, but the effort required would not be a major expense.

If it is suggested that we should run a national campaign for immunization against influenza one might reasonably ask what evidence there is that this would produce anything more than an increasing, if small, number of persons in the population who had become sensitized to egg protein. Annual vaccination with the right vaccine of everyone in the country would probably reduce the severity of the periodical influenza outbreaks, though it is unlikely that this would prevent an outbreak in an epidemic year. General immunization on this scale would take much time, would cause some fatalities, and would involve the use of vaccines prepared from current influenza strains. We could not expect to protect the whole population against strain variations unless the technique developed in France for producing a vaccine strain which may prove to be the next variant can be shown to be successful. One can only conclude with Sir Charles Stuart Harris and other experts in this field that currently available influenza vaccines offer no prospect of preventing outbreaks of influenza, and are only likely to be of value in the selective and annual protection of much smaller groups specially susceptible to serious even fatal complications of influenza. There may be greater hope of evolving drugs active against this and other respiratory viral infections.

PREVENTION BY CHANGE IN BEHAVIOUR

The preventive measures that offer the greatest possibility of improvement in the health of the nation involve changes in the habit

Change in preventive medicine

of life of many people. The most obvious is the reduction of cigarette smoking. The expectation of life of the average man in Britain would certainly be increased by as much as two years if the smoking of cigarettes was abandoned. The heavy smoker aged 25 has an expectation of life six years less than the non-smoker. There is increasing evidence that at the same level of smoking as now, the damage inflicted by the cigarette would be less if its tar content was reduced. That might result from modification of the tobacco, or from the use of some synthetic or modified substance such as is now being proposed; but we do not know this with certainty and we will not have full proof for many years. It may be that three factors contribute most to the continuation of cigarette smoking; social conformity, nicotine addiction, and the skilful promotion of sales of cigarettes for commercial gain. If nicotine addiction is a main factor, as some suggest, its reduction is not impracticable but its prevention would be more certain. It would be possible, if government so chose, to control sales promotion and to increase the cost of smoking by taxation. It would be reasonable to restrict further the expenditure on sales promotion and the opportunity for smoking in public places. It might then be easier to secure social rejection of a habit which is after all objectionable to that half of the population who do not smoke and harmful to the other half who do.

The main lethal consequences of smoking to the smoker are chronic bronchitis, lung cancer, and early myocardial infarction. An increase in invalidity also occurs even amongst schoolboy smokers. These penalties are well known and are avoided by the great majority of doctors themselves. The largest single contribution to the prevention of illness and death in Britain today would be provided by the cessation of cigarette smoking. What government on the one hand and the health professions on the other can achieve depends on what the general public is prepared to accept. Every specious argument is produced, from the need of government for the taxes involved to an unscientific refusal to accept the validity of the epidemiological evidence. We can have intense public debate about the dangers of animal fats or sugar in the diet, the implication of neither of which is yet certain, while the certain implication of cigarette smoke in the aetiology of coronary artery

Change in preventive medicine

disease especially in younger men receives negligible attention. The Royal College of Physicians has done more than any other agency public or private to identify the nature and extent of the damage but its message has not been sufficiently heeded or acted upon.

It probably is true that over-eating and consequent over-weight play a part in the incidence of coronary thrombosis as does lack of exercise; the reduction of either involves changes in personal habits which relatively few of us are prepared to accept. As a people we avoid some of the pressure to pay the price in personal effort by not being prepared to look clearly at the health costs. Just how far large-scale intervention by many doctors would be effective in all this is uncertain. It is probable that the greatest medical impact could be produced through general practice, but some doctors are reluctant to use that privileged opportunity to intervene strongly in the life style of patients. Doctors are not the arbiters of their patients' life styles, but the full realization of the function of family doctor can hardly omit some contribution here.

PREVENTION THROUGH HEALTH EDUCATION

Medical argument is still proceeding furiously as to whether sucrose or cholesterol or saturated fatty acids make specific contributions to the development of atherosclerosis. Since the public is unlikely to respond to anything but a clearly defined positive message there is a great temptation to give firm advice based on one or other of these contesting views. In some countries this has been done and the outcome may be helpful if it results in less frequent occurrence of overweight and more regular physical exercise. The Swedish health education programme on diet and exercise is a good example.

Hetzel contrasts the contemporary Australian illusion of the lean, open-air, athletic, physically tough Australian male with a different picture he draws of a somewhat slothful city dweller, over-weight and drinking too much beer. That picture may be deliberately over-painted, but a similarly realistic view of the average British male may be helpful for the future. Undoubtedly most British men of middle-age and later would be better if they

Change in preventive medicine

took more regular and more intense exercise, consumed less sucrose and less fat of any kind and were in consequence of lower weight and better maintained physical capacity. Just how far the medical profession can hope to bring about such a desirable result must be doubtful. It must be even more doubtful whether they should advocate the elaborate changes in diet which have been advised by some specialist groups in other countries. Sir Frank Young's subcommittee of the Committee on Medical Aspects of Food Policy carefully reviewed the evidence and reached this conclusion in a report published by the DHSS in 1974.¹ It is sometimes difficult to hold back from the eager rush to action, but this time it makes scientific sense to do.

The fluoridation of water for the prevention of dental caries is another great opportunity for better health and it has been obstructed in Britain by honest, but misguided, campaigns of emotional counter-propaganda. No good evidence of harm from fluoridation has been produced. If we could carry the same conviction with the public in Britain that the health authorities in New Zealand have been able to carry there, we could prevent a large part of the dental caries from which our children now suffer and probably improve their dental condition throughout their lives. Dental caries was a more serious problem in New Zealand than in Britain and perhaps that is the reason why they have accepted more completely than any other developed country the benefits of fluoridation of drinking water. They are already benefiting from a reduction in staff required in the school dental service. The sensible policy of the city of Birmingham has shown how we could have the same benefit. Anglesey, inspired by Wynne Griffith, who was later to be the UK chief spokesman when he persuaded the World Health Assembly to commend fluoridation, has only half the dental caries in children up to age 15 compared with neighbouring Caernarvon.

The possibilities of prevention in the future rest much more with public education in health than with the individual contribution that doctors can make. Change in medicine is not likely to produce further great improvements such as those obtained by

1. *Diet and Coronary Artery Disease*. DHSS Reports on Health and Social Subjects 7 (London: HMSO, 1974).

Change in preventive medicine

specific prophylaxis of infections unless drugs more effective in mental disorder or respiratory virus infections appear. The greatest contribution to the promotion of health in the last hundred years has been by improved nutrition, education, and sanitation. These may have been stimulated by doctors but they are not primarily medical contributions. The next phase in preventive medicine will be far more difficult; it involves persuading most people to make conscious changes in their own behaviour.

CHEMICAL FACTORS IN THE ENVIRONMENT

Some relatively recent changes have been made necessary by recognition of the hazards from chemicals either deliberately introduced as drugs or added to foods; or present in food or the environment as residues of pesticides, herbicides, or industrial wastes; or used in industry or agriculture. There may also be unrecognized adverse effects of substances long present in trace amounts or of the absence of some elements—as the adverse effect of low fluoride intake went unrecognized for so long. It is likely that as much as 50 per cent of all cancer is due to environmental factors of which smoking is the most obvious. It has been suggested that as much as 85 per cent of cancer is avoidable if relevant external agents can be removed, though that may never be completely possible.

The machinery for prevention of many of these hazards is central rather than peripheral as protection against older environmental hazards had been. The Medicines Commission and the earlier (Dunlop) Committee on Safety of Drugs were established after the thalidomide disaster but control machinery had existed much earlier in the USA and Canada.

The original task of the Dunlop Committee was to screen new drugs proposed for marketing, but the later statutory machinery goes much further in controlling by licence existing drugs. The Medicines Commission did not at first attempt to review relative efficacy as the Food and Drugs Administration has done in the USA or state control systems do elsewhere. The Commission finds this stance no longer tenable and a ten-year programme of review is now in hand. The Cohen and Macgregor Committees conducted

Change in preventive medicine

an informative review for many years but without direct authority. The new power of licensing will help, but the greatest benefit will surely derive from the educational effort suggested in Chapter 3. There can be little doubt that future pharmaceutical developments will require continued strengthening of the defensive net. The main protection is provided by close control during production and the existing inspection and licensing is a necessary guarantee that this continues.

The method of control of food additives has been different but presents some of the same toxicological problems as control of medicines. Teratogenesis, mutagenesis, and carcinogenesis are of concern in both, along with other toxic hazards. The possibility of formation of toxic chemicals in food as a result of processing in particular ways must also be considered. There may be naturally occurring factors in some foods which need modification. The change in the rape seed used in Canada in order to obtain an oil product with less erucic acid was undertaken because experimental evidence in animals suggested that a high intake of that constituent might promote cardiovascular changes. There may be products of bacterial action in the gut which can be carcinogenic.

Additives like sweetening and emulsifying agents, colouring or sweetening agents, and preservatives must be regulated by central action on medical and scientific advice, but enforcement is local. The problem for the clinician is that of detecting ill-effects, which may be insidious and non-specific or specific and emerging abruptly. The change required is the use of suitable central advisory machinery with a large medical component and the development of regional scientific and clinical groups able to advise the local clinician. The central facilities have been established, though more laboratory resources for both research and day-to-day investigation are needed. The regional and local resources are only beginning to appear. As yet, only the University of Surrey, through the personal initiative of Professor Dennis Parke, has developed a degree course in toxicology.

International exchanges have become increasingly important in these fields because reports of new findings are peculiarly liable to arouse public alarm. An apparently authoritative pronounce-

Change in preventive medicine

ment, even though made by a scientist working in an unrelated field or a journalist quoting unidentified sources, is assured of wide publicity if only because official sources are so guarded. If some other country, especially in North America or Europe, has imposed restrictions, perhaps only as a precaution, pressure for action here develops at once. An alarming report supposedly incriminating blight-affected potatoes as the main cause of foetal injury leading to spina bifida was the more easily handled because of contrary evidence supplied from the USA. The allegations about toxic effects of lead in motor car exhausts forced more severe restrictions elsewhere with, possibly, more harmful results from incomplete combustion. The British assessment is not always right and it behoves the central departments to know what their colleagues in other countries do. Needless and serious damage may be done to an industry without good cause, since proof of a negative may be difficult and take long to demonstrate. On the other hand, warnings are not always heeded when they should be. It was easier to persuade Americans, Canadians, and Swedes of a threat to health from modest mercury levels in fish—even though no harm to man had been detected—than to convince Neapolitans of the presence of *vibrio colerae* in shellfish during an actual epidemic in their city.

THE DEVELOPMENT OF CENTRAL CONTROL

Control of industrial hazards is easier in one sense because public opinion can be expected to favour action on good evidence, but more difficult in another because effects may be very long-term. The dangers of naphthylamine or crocidolite were relatively easy to demonstrate after the lapse of time, but there are unresolved questions about the carcinogenicity of other chemicals which may have far more delayed and anatomically more remote effects. We are still mainly concerning ourselves with specific attributable lesions and only occasionally with the possibility of accelerated onset of chronic degenerative conditions which also occur quite frequently without known precipitating factors. Specific tumours of pleura, lung, nasopharynx, and liver or characteristic pulmonary or cutaneous lesions may be so closely linked to particular

Change in preventive medicine

exposures as to be attributable with a high level of probability. A relative excess of cancer of oesophagus or stomach in a particular area may not be so readily attributable and some increase in degenerative cardiovascular disease even less so.

The central protective screen, which consists of interlocking expert groups extending from a continuous watch on nutritional state and food intake at one end of the spectrum through monitoring food additives and changes wrought in food processing, to the hazards of cytotoxic drugs at the other, has been developed quietly in the last dozen years. It links with the Health and Safety at Work organization, the Government Chemist, the Medical and Agricultural Research Councils, the Department of the Environment, Home Office, and the Ministry of Agriculture, Fisheries, and Food as well as the health departments. It may be that an organization comparable with FDA in the USA would be thought more appropriate by some, especially if it could be on an EEC basis, but that would cost far more and might be less efficient. The progressive changes in this area have been evolutionary and have preserved a wide net of communication in the relevant services. There will be change no doubt, as there was much earlier in developing the Public Health Laboratory Service and the Radiation Protection Service, but it need not be of the same kind.

PREVENTION BY EARLIER DIAGNOSIS

Both recent Canadian (Lalonde, 1974)¹ and Australian (Hetzel, 1974)² publications, drawing heavily on McKeown's work, emphasize that environmental control and personal prevention, and not curative medicine, have made the major contributions to the reduction in mortality in developed countries. New drugs, particularly the antibiotics which are effective against infective conditions, have made the other great contribution. Behind all the progress of the last hundred years improved nutrition and improvements in the physical environment may have done much without the intervention of medical care at all. The treatment services have their own opportunities for preventive action in

1. *A New Perspective on the Health of Canadians*. Working Document of the National Department of Health and Welfare (1974).

2. Hetzel, Basil S., *Health in Australian Society* (Pelican Publication, 1974).

Change in preventive medicine

secondary preventive work for the limitation of disability. This takes the form of earlier diagnosis permitting earlier and more effective therapy and better rehabilitation after treatment. These are means of dealing with the problems of injury or of chronic degenerative conditions.

Antenatal care has become so much a part of the ordinary pattern of medical care, that one might forget that it was originally essentially a screening programme. Most antenatal supervision is the observation of a perfectly normal process and therapy plays quite a minor part in it. No one would now contest that meticulously performed antenatal care is usually more important to maternal safety than any expert manoeuvre at the time of delivery. The expert manoeuvre is life-saving in the exceptional case, but the great reduction in maternal mortality owes much more to improved antenatal care.

The use of the hospital as the place of delivery is perhaps the next most important contribution and provision for a larger proportion of hospital confinements in Scotland and in Wales at an earlier stage than in England may have played an important part in the more rapid reduction of maternal mortality in those countries. But the place of delivery tends to be the main point of argument whereas really it is pre- and post-natal care that most needs improvement. That is amply confirmed by the six three-year reports¹ on the confidential inquiry into maternal deaths. The number of deaths may now be very small, but we should be even more concerned about the prevention of morbidity. The greatest need in hospital obstetric programmes now is for the improvement of care for the small premature baby or other neonate at risk.

The school health service and child health programmes have also been of a screening nature. They have undoubtedly made their contribution to the improvement in child health and particularly to the reduction of post neonatal mortality and mortality in early childhood which has been as great in Britain as in most countries outside Scandinavia, the Netherlands, and Switzerland. At least as important has been the improved diagnosis and care for the handicapped child. Timely detection of congenital

1. Ministry of Health, Reports on Public Health and Medical Subjects nos. 97, 103, 108, 115, and 119 and DHSS Reports on Health and Social Subjects no. 1.

Change in preventive medicine

deafness or congenital dislocation of the hip is vital to treatment. Developmental paediatrics, practised largely outside hospitals although inspired by such as the Newcomen Clinic at Guys, has become quite as important as the more esoteric paediatric skills in the best paediatric hospital units. It is not by chance that the teaching departments are now labelled 'Departments of Child Health'. On the one hand we need better expert paediatric care for the threatened neonate, but on the other hand a much more widely diffused concern for the health of the majority of children who lead apparently normal lives and develop normally. Two of the most intractable problems concern the unforeseen cot death and the battered child. We are still uncertain of the aetiology of the first, and have done too little to inquire into it. In the second we are not concerned with a purely medical phenomenon. The battered baby problem needs the participation of many other groups than doctors. It is one of the clearest examples of health problems to which a multidisciplinary approach is essential.

There could well be a non-surgical method of terminating pregnancy before very long. Just what effect that would have on the health of the country must be uncertain. It seems that the great reduction in mortality from abortion which has followed the introduction of the Abortion Act must have resulted from the reduction of illegal intervention. No one yet knows whether there is a price to be paid in terms of later morbidity or sterility, but that should not blind us to the gain that has been achieved. More effective use of contraception and perhaps an increasing use of sterilization must have played a part by reducing the number of pregnancies in older women and in those who have already had three children. There are many who would point to the number of very early foetal deaths and scoff at any claim that the Abortion Act has been in any sense a contribution to preventive medicine. Yet the number of lives of women saved must be between 100 and 200 and those foetuses and doubtless many others would have been sacrificed in illegal abortions anyway.

These preventive activities tend to have been encouraged from the centre, suitably stimulated by some pioneer, rather than evolved at the periphery. Legal abortion of course resulted from a Private Member's Bill. The promotion of secondary prevention

Change in preventive medicine

by schemes for early diagnosis has also been encouraged from the centre but the development of rehabilitation services, particularly amongst the elderly, derives mainly from the effort of particularly interested units. There is a large field for improvement in the organization of medical work in such services as these and probably the establishment of regional demonstration centres would be the best method of encouraging it. In any event the application of preventive services is a local matter, apart from the chemical surveillance which has been mentioned earlier. Certainly the best and safest use of the potent drugs now available depends absolutely on the dissemination of knowledge locally and the local exchange between relevant specialists and the generalists.

There are several supportive or preventive programmes in mental health which may have had wide effects not readily proved. The large Child Guidance Service uses considerable resources in both schools and hospitals. It was last reviewed in the biennial *Report on the Health of the School Child* by Kingsley Whitmore whose conclusions were guardedly favourable. Marriage Guidance Council work is on slightly firmer ground. Activities such as Alcoholics Anonymous and the Samaritan organization have certainly met some needs. More directly psychiatric activities such as the care of patients admitted after drug overdosage or known self-poisoning have been encouraged in reports of the SMAC and should be expanded. Much of the recent improvement in psychiatric care is the result of earlier intervention. In this field treatment and prevention must go hand in hand.

SCREENING FOR INAPPARENT DISEASE

Some of the most expensive additions to health service in recent years have been screening programmes of a different kind. In the context of current medical and public opinion it certainly would have been impossible to ignore screening for cervical cancer by the use of cytology; in fact it was centrally encouraged. The inception of that programme in Britain can be traced to the Standing Medical Advisory Committee on whose advice the development was encouraged and provision was made for the training of the necessary technicians so that laboratory services could be

Change in preventive medicine

provided. Ten years after this movement began one might think that we should be able to present evidence of cost benefit. There are suggestive pieces of evidence from this country and from North America, but there is no real proof even yet.

There has been a fairly long-term downward trend in the standardized mortality ratio from carcinoma of the cervix since before the cytology screening programme was introduced, particularly in the younger middle-aged group of women. It is impossible to say whether the fall from a standardized mortality rate of 100 in 1968 to 95 in 1971 is attributable to early treatment as a result of cytology. Admission rates to hospital with this diagnosis at ages under 65 have increased by almost half. There seems to be sufficient justification for the programme as it stands; that is encouraging screening of all women aged 35 and over and of younger women who have already had two or more children. But the problem of deciding on the treatment of a young childless woman with a positive smear remains. It is far from certain that carcinoma *in situ* in such a patient will progress to invasive cancer. A more complete programme for the groups already given priority is better justified on the evidence available now.

Another screening programme, that for phenylketonuria, is now virtually complete so that few newborn children fail to be tested. The outcome is that 50 to 60 children a year are diagnosed and treated; the evidence is slowly accumulating that this may indeed have reduced the extent of cerebral damage. If treatment prevents the occurrence of severe mental handicap in even 30 or 40 children a year, the saving in expenditure in future years could be computed and would be large. It may well be that the saving in cash terms would be greater than the cost of the whole exercise, although the diet is expensive. It is one of those cases that cannot be proved until years after the job has been undertaken. Obviously the gain will not only be in cash benefit to the Health Service, it will be even more in human benefit to the families concerned. There is, however, the further consideration that this congenital condition may be rather more frequent in the future because of the survival into adult life outside institutions of men and women with the relevant genetic pattern, though this would require reproductive capacity of which we do not yet know.

Change in preventive medicine

Screening for chronic glaucoma has not been pursued and evidence obtained in Britain suggests that it should not be. But screening for diabetes or for hypertension presents greater difficulties. It may well be that the pattern of medical practice in Britain with its emphasis on primary care gives the best opportunity of selective screening for these two conditions. The real, unresolved problem is that of selection of the level of blood pressure above which hypotensive treatment is desirable. That could be resolved by a controlled trial on a large scale and at heavy cost and a valuable preventive programme might result.

Automation of laboratory methods has made it possible to undertake large screening programmes using multiple blood chemistry and other tests. The best known of these was undertaken in Varmland, one of the counties in Sweden, a decade ago. A vast amount of information was accumulated about a large proportion of the population of a particular area and it is significant that despite the excellent field and laboratory work we are not yet in a position to reach conclusions about the value of such procedures now. An attempt to devise a health index based on the results of a battery of tests has, not surprisingly, been unsuccessful.

It may be that multiple tests on the individual at intervals will be a valuable addition to his medical record in future. If the intervals were of the order of ten years the record would provide a background against which subsequent variations in individual parameters could be more meaningful. Even in hospital work the extent of automated multiple investigations has been questioned. The best use of these new methods of investigation will not be achieved through random medical judgement, but only by field investigation. The present danger is that the ability to measure may be used at mounting cost without regard to the real benefit to the patient.

Periodical medical check-ups have not become popular in this country. When Marsh of Stockton-on-Tees undertook a temporary exchange of practice with a Canadian practitioner one of his comments was that the practice of periodical medical examination formed a very much larger part of the work of general practice in Canada than in Britain. There have been programmes such

Change in preventive medicine

as that of the Institute of Directors which have been used on considerable numbers here, but the nearest counterpart to North American practice may be the 'dispensarization' system in the USSR. The medical check-up in North America is undertaken at the patient's wish and indeed at his expense, unless it is part of some system of group medical care, like the Kaiser Permanente. In the USSR, the organized health service provides a system of medical review for certain groups of patients and certain age groups. Very careful medical examination both general and specialized is undertaken at predetermined intervals for school-children, for patients in certain age-groups in later life, and patients who have had particular illnesses. The object is both preventive and curative, but the results do not seem to have been clearly assessed, at least with any kind of control. The system may well be based on a belief that if medical examination is useful in some circumstances, more of it must necessarily be more useful. There was a time when our own school health service, before it became more selective, seemed to work on the same principle.

Screening for the detection of congenital defects may permit early and effective treatment as in congenital dislocation of the hip or congenital deafness. Screening for Rhesus sensitization was similarly valuable, especially before the prevention of sensitization became possible. New methods of screening for foetal abnormalities requiring amniocentesis are now being advocated. Down's syndrome is the clearest example but only in older women or those who have already had an affected child; the risk to mother and foetus is still being investigated. It now seems possible that a test for raised alpha-foeto-protein will be developed to help in the early diagnosis of spina bifida, before it is too late to justify abortion. This advance could help to reduce the frequency of some of the most distressing congenital abnormalities—subject always to public acceptance that abortion for such a reason is justified.

A full discussion of the justification of screening is beyond the scope of this monograph. Selective screening through general practice is certainly gaining ground on general considerations rather than strict appraisal of past results. In general, the special subcommittee of the Standing Medical Advisory Committee

Change in preventive medicine

has been sceptical of the value of large screening programmes and we have not been stampeded into them as has happened in some other countries. Two experimental programmes in Rotherham and Southwark have not been continued. So far our approach has been to discourage major changes until better evidence is produced and no doubt much waste of resources has been prevented. The NPHT working groups have reached much the same conclusions and the subject is well reviewed in a group of short papers in *The Lancet* in November and December 1974.

All this adds up to much progress in prevention by methods already defined, but to a larger new problem requiring different methods. Prevention now requires not just that things be done to a submissive population, but that the people be involved themselves with understanding both of personal and environmental contributions. It is also necessary that the health professions working in curative medicine shall be involved in and become protagonists of prevention. The environmental surveillance and action may rest largely with non-medical people, but new and more complex physical and chemical factors are being defined. A medical co-ordinating role is as important now as it has ever been and we are fortunate that our central and local organization provide for it.

Change in the health professions

Within the medical profession in the last twenty years there has been from time to time considerable tension in the relationships between its younger and older members. The NHS must bear some of the responsibility for this. In the hospital field practically all remuneration is by salary. The NHS controls most of the training posts apart from those in university departments. The salary scales are fixed and national and determine the timing for holding different posts.

In many other countries, young doctors can seek opportunities to supplement their earnings from training posts, by such work as they may be able to do in private practice at a much earlier stage in their professional careers. That method of support would not be acceptable in an NHS that sets out to provide full care for all the population, though some juniors do earn extra by helping in general practice. Unless the salaries paid to doctors in training are generous, however, the situation for some of them may be precarious—particularly if the training period is prolonged.

In Scandinavia this situation is met by paying salaries at a high rate to doctors from the time of their qualification, with a relatively small step on reaching the senior, established grades. That often means that a man can, and does, remain nominally in training for a long time. In the NHS in 1974, however, the full-time salary range within the hospital service extended from some £2,000 a year at the bottom, perhaps with extra duty allowances, to some £16,000 a year for a small group at the top.

This would not matter if training paths were properly planned and not too long, so that junior doctors went into the right paths with the right outlets at a fairly early stage in their careers. But failure to recognize the kind of training that generalists, for example, would need has only too often resulted in young doctors

Change in the health professions

being led up blind alleys. Often in their frustration they were later to try and escape by emigrating to countries where they might be given an opportunity of practising specialist skills which they had developed, but for which there was no outlet at home. Those who persisted here often spent four or more years longer than their training required working as senior house officers or registrars while waiting for the senior registrar post which was the gateway to a specialist career. Even now many specialists would maintain that they must have support at registrar level, without recognizing that if all specialists are to have registrars whose work is restricted to their own specialty, then there will be nowhere for most of those registrars to go in that specialty. It is clearly desirable that close support should be given to consultants and, even more importantly, to their own juniors by doctors at registrar level. Some of that support may have to come from doctors whose experience as registrars is not necessarily confined to the specialty in which the work is being done. Experience at registrar level for long periods will not be useful to doctors who are going into general practice unless it is part of a sequence which also gives them experience in other specialized fields.

The matching of numbers of doctors to openings for them in the different specialities will only be achieved if considerable care and skill are exercised in counselling younger doctors about the paths which they should follow to establishment in their later work. A recent study in Southampton, however, shows that even in that teaching centre counselling had often either not been sought or not been provided. Of thirty-four SHOs more than two-thirds had been given no previous advice and generally knowledge of general practice was wholly inadequate.

Financial problems and shortcomings in counselling are only part of the difficulty. Younger doctors may experience other sources of frustration arising from their training. For example, some may prefer to follow training paths that are not too precisely defined but which leave room for variation and movement from one path to another. The training programmes in the various specialities produced by Royal Colleges and specialty associations tend to be more and more detailed, however, so that a change may mean a considerable delay and, in consequence, greater financial

Change in the health professions

strain. A different example may occur when, as sometimes happens, the newest techniques are more in the hands of younger doctors than of their seniors. Those who develop such techniques, perhaps at a fairly early stage of their careers, may achieve an expertise which is valuable to a unit. Yet the senior staff of the unit may not be prepared to make an opening for the individual to remain as an established consultant doing such highly specialized work, because of its limited range—a genuine if sometimes misguided concern.

Of course, the doctor who happens to be younger is not necessarily right on that account. Nor for that matter is the older doctor necessarily right simply because of his longer experience. He may have acquired his professional knowledge in a pattern which is inappropriate to some of the latest scientific information and that may make it extremely difficult for him to relate new advances to the knowledge that he already has. He may even be unfamiliar or out of sympathy with the kind of burdens that some of the newer work places upon his juniors. The tensions are well described (and illustrated) in Innes Williams's¹ gently satirical paper *Aggressions in Medicine*.

Ten years ago there was a rather unhappy episode when a particular physician at a hospital in London, seeking to help those of the junior staff who were faced with the need to decide in a matter of seconds whether to attempt resuscitation after cardiac arrest, put up a notice which said that resuscitation of patients over 65 should not be attempted. Unfortunately the notice was in a position where it could be seen by patients; it came to be recorded in the press and attracted public criticism. Its intention was humanitarian, but it displayed a rigidity unacceptable to many doctors and most members of the public. Given as an indication rather than a directive, and put in context, it might have been of value to the young doctor by telling him that he would hardly be open to criticism if he did not try to resuscitate an 80-year-old patient with advanced malignant disease. Such is the difficulty of the subject, however, that although different guidance was suggested, it is doubtful whether it was any more helpful to

1. Innes Williams, D., *Aggressions in Medicine*.

Change in the health professions

junior staff than the attempt made at this particular hospital to give a firm indication based on age alone.

Nevertheless, this is the sort of subject on which guidance should be given in so far as that is compatible with the circumstances of individual patients, by senior staff to their junior colleagues, not by health departments to the professions. It is also a matter upon which the views of the junior colleagues should be canvassed. Nor is it a matter for doctors alone, since the first person on the scene and the first to act will usually be a nurse, and nursing opinion should be given due weight in any conclusion reached. Moreover this is a subject on which sensitivity to the feelings of relatives and patients is paramount.

The Cogwheel Working Party has repeatedly made the point that junior staff should be treated as members of the divisions. It is certainly true that the Cogwheel Working Party when re-established to produce its third report found it of real value to have amongst its members some who were substantially younger than any of those who had taken part in the production of the two earlier reports. The third report, even more than the first and second, dealt with matters of great concern to junior staff. The work of a division can hardly be organized without a proper understanding of the contribution that juniors can make, or without their agreement as to the way in which it should be made. Junior hospital staff constitute three-fifths of the total medical staff of hospitals and, clearly, it is not right that the activities of all should be governed by the views of two-fifths. Even when the average age of appointment to the consultant grade is brought down by the three or even four years, which seem to be desirable, there is still every reason why juniors, who may no longer include so many in their middle or late thirties, should be brought into consultation in the organization of the work of the whole division.

The dissatisfaction that developed between the profession, or some parts of it, and the General Medical Council was more loudly expressed by younger doctors than by their seniors. That may have been partly due to the fact that the younger doctors understood less well what the GMC was trying to do and how well it had done it. Relationships within the profession were clearly not satisfactory if such knowledge was not more widely

Change in the health professions

disseminated. It may also be that the younger doctors perceived more clearly the different nature of the problems of education and of discipline and the advantages of separating more decisively the machinery each requires.

During the last six years when I was in office I had the great advantage of having some younger doctors in the registrar/senior registrar grades who came in at intervals as a discussion group to talk over matters of interest to them or to me. It certainly was an informative experience for someone working at the centre, well away from the clinical field, to have the uninhibited views of a group which was not engaged in negotiation and, for that reason, less disposed to hold back. It is difficult for one at the centre to keep effective contact with much younger colleagues, but without it understanding is more difficult still. There is a cohort phenomenon in understanding which seems to affect medicine even more than other professions.

Anyone who has experienced the clinico-pathological conference of a large American hospital will be well aware of the forceful and critical comment that is expected from and is made by the younger members of the staff. There has been a more hierarchical tradition in British medicine than in medicine in North America, but its effect has been exaggerated during the period of the NHS because junior staff, who until recently had been reaching the consultant grade progressively later, were subject to the process longer. Even now, despite the increase in the rate of growth of the consultant grade, out of almost 10,000 consultants in 1972 there were less than 250 who were aged under 35. Since most of them will have been qualified for ten or more years at the age of 35 such a number (one-fortieth of the total) is clearly far too small. There were twice as many consultants aged between 40 and 49 as between 30 and 39, and more aged 50 to 59 than aged 40 to 49. The reasons for this phenomenon are well known and the remedies are beginning to be applied, but it is a pity that it has taken so long to bring about this change. It must have made a larger contribution to our loss of doctors through emigration than almost any other single factor.

It may be difficult for the older doctor to appreciate how greatly the conditions for his juniors have changed from those he

Change in the health professions

himself experienced. The decisions that have to be made in clinical medicine are of a less autocratic kind than they once were, but they are still decisions which finally rest with one person. The fact of having to make such single-handed decisions in the course of a clinical career so many times (and often with such profound effects) in itself predisposes toward authoritarianism in other ways. The decisions now made in clinical medicine are made in the light of much more precise and extensive information than those of even twenty years ago. Some of that information may be derived from sources which are not strictly medical. Much of the scientific work related to medicine can be handled in part by people without medical training and the great growth in the technical and scientific grades in the hospital service is evidence of this. The tendency of the medically qualified to regard their own contribution as unique, and very often final, seems a tradition that should be modified. A biochemist or a physicist, not medically qualified, may provide evidence about some patients which is as much the determinant of the diagnosis or of the future course of treatment as the clinical judgement of medical staff. The calculation of radiation dosage is only the most obvious example.

The undercurrent of dissatisfaction at lack of recognition of the contribution of the scientifically qualified which lay behind some of the agitation before the Zuckermann Committee reviewed hospital scientific services was much greater than many doctors realized. The Zuckermann Committee proposed solutions which aroused some difficulties in the minds of many of the doctors who might be affected. The almost shocked reaction in one medical journal, that a non-medically qualified biochemist at the head of a department could conceivably be endowed with the responsibility for a final decision about a patient—a situation it found quite unthinkable—was an apt illustration of this. Yet some of the most distinguished biochemists working in the hospital service today are not medically qualified, and their contributions should be recognized as being of the same relevance and importance as those made by medically qualified colleagues. Scientists at this level should be regarded as unquestionably the equals of their consultant clinical colleagues. Many less fully qualified working as graduate scientists or as technicians, make a contribution, both

Change in the health professions

scientifically and in management, that should be more widely recognized by doctors than it now is. The programme of development of hospital scientific services inaugurated for the DHSS by Professor Ian Wootton would lead to a strengthening of the medical position because it is more broadly based in a partnership with scientists than one limited to those with medical qualifications alone. This is not dilution of medicine by less qualified staff, but recognition of a specific professional contribution which doctors may not be able to match whether it be in the laboratory-based sciences or clinical psychology or even optometry or environmental health protection.

There are many other branches of knowledge, for instance in mathematics and in engineering, which could make a contribution to medicine if they were given the opportunity. The importance of such a contribution should be more widely understood. Some of the problems of circulatory disease have relevance to engineering science and it seems more likely that future advances in assistance for cardiac failure will come from the development of supporting machines than from cardiac replacement by transplantation. The valve used in the relief of hydrocephalus and the first widely used cabinet respirator were invented by engineers, not by doctors. Engineering has an important potential in the automation of laboratory procedures in physics, clinical physiology, haematology, and biochemistry. The simplification of designs requires engineering skill which doctors and chemists do not necessarily possess. In the development of prostheses, even in the development of ward furniture which may be of assistance to the disabled, the engineers could make a much greater contribution than they have had the opportunity to make so far.

The computer scientists have been coming into their own, but still have had to rely on collaboration with doctors who have had too few opportunities to appreciate what assistance the computer can give. Specialization in medicine is certain to advance and become even more important; it must be equally apparent that the application of non-medical sciences to medicine can hardly be left to medical skills in those sciences which may be incomplete.

Technologists now play an important part as members of clinical teams in many of the diagnostic and treatment services of a

Change in the health professions

hospital. If they are not given a reasonable share in the control of their own work by the doctors under whose general oversight they work, their dissatisfaction is certain to continue. It may, indeed, become exaggerated to the extent where an undesirable degree of independence might be demanded. The example of the remedial professions should be remembered. The medical profession has not applied itself generally with either the understanding or the general enthusiasm that adequate rehabilitation services require. Yet doctors have still sought to control the remedial professions, often in a degree of detail which is quite inappropriate to the extent of their own familiarity with the techniques employed. It will be a sad thing if the remedial professions drift further away from medicine, for their contribution would be best made in collaboration with, and neither separate from nor subordinated to, the medical contribution.

Nurses are not medical technicians or medical aides. Nursing is a profession which makes its own special contribution to the care of the sick in collaboration with medicine. In some countries the control of nursing by medicine is close and detailed. In the USSR the nursing administration in a hospital is usually undertaken by a doctor, and many of the people who have been trained as nurses go on to train in medicine. We have not developed nursing in that way. Nor have we followed the line of South America, where a university course in nursing may cost as much as a university course in medicine and attract far fewer recruits.

The tradition in British medicine is of collaboration between doctors and nurses. Nurses have a right to their own independent conclusions about the way in which nursing progress would best be made. While doctors are affected and should have the right to comment and suggest, they should not expect to be able to veto. Some of what is written by doctors about the 'Salmon'¹ changes in nursing organization demonstrates all too clearly the nostalgia of some senior doctors for a situation which has not existed for at least two decades. It was not ideal or universal when it did exist. The part that women play in our society now means that many who were trained in nursing will leave their profession shortly

1. *Report of the Committee on Senior Nursing Staff Structure* (Salmon Report) (London: HMSO, 1966).

Change in the health professions

after qualification and be available to return to it some years later. They are more mature people; that in itself is a gain in nursing. And they expect to be admitted to a consultative partnership to an extent that doctors have not always conceded to them. Medical decisions about medical development are apt to be taken without regard to the fact that they require certain corresponding actions in regard to nursing organization and staffing. From time to time efforts have been made from within the medical profession, notably by the BMA, to remove misunderstandings between doctors and nurses in this country, and relationships are better than those in some other countries of the English-speaking world.

Perhaps unexpectedly the most recent development in the close partnership between medicine and nursing is in general practice. The association of health visitors, midwives, and home nurses with groups of GPs often leads to the most satisfying kind of doctor/nurse partnership to be found in the health service today. Though a recent report to the Council for Health Visitor Training suggests that the partnership is still too often at best sub-optimal in the best group practices it is effective and close. The changed administration in the NHS is designed to give nurses a more direct part in the planning and operational control of the Service than formerly. The old situation in the hospital—in which fewer nurses worked longer hours, and senior nurses tended to have longer careers and not to marry—has gone forever. It is unlikely that anybody would wish to restore it, even if this could be done. Nevertheless, the understanding which exists in good group practices, and is reflected in some hospital wards, will only be established generally in hospitals with considerable effort. Most of the effort will have to come from the medical side because it is there that understanding has often been least apparent.

The profession of medicine shows its greatest uneasiness in its relationships with social workers. The medical evidence to the Seebohm Committee on the Social Services was more remarkable for its lack of perception of the capacity and aspirations of social workers than for its understanding of the relationship of health services to the whole array of social services within which the health component is set. Many clinicians had good working relationships with 'their' social workers who had often escaped

Change in the health professions

only recently from the designation 'Almoner'. Since the completion of the Seebohm reforms, many clinicians who worked well with social workers assigned to their own fields, perhaps as staff of a unit, have been aggrieved by the disruption of an arrangement satisfactory to them. There have undoubtedly been local reductions in the quality of some services in order to make possible more general improvement.

The medical bias is naturally toward stressing health in terms of technically measurable factors and clearly definable results. The social worker's approach is different and his or her value judgments are not readily, nor necessarily rightly, overruled by a medical colleague. There are occasions, within the field which doctors may regard as 'health', when social considerations may be overriding. The issues have been fully discussed by Huws Jones in his Heath Clark Lectures for 1969.¹ As with doctor/nurse relationships, doctor/social worker relationships have been best worked out in good group general practice, as well described by Forman and Fairbairn.² The egalitarian relationship of good group practice may well make the adjustment easier than the hierarchical professional structure of a hospital. In the working context of our largest health centre at Teesside the most hopeful development can be seen already. Sadly the evidence from a recent television series on the NHS shows how unappreciative some GPs and specialists can be of social workers.

Bearing in mind the great growth in attachment of health visitors to group general practice within a single decade, we can hope that a similar change will occur with social workers. There is the same need for both sides to realize how much each can gain from the other. The prospect of community services leading and teaching the hospital services adds a slight piquancy to the situation.

One of the most worrying indices of the unease in the health service at the present time is the apparent deterioration in the relationships between the health professions. Whatever the merits of the controversy about pay beds in hospital, one distressing

1. Huws Jones, R., *The Doctor and the Social Services* (London: Athlone Press, 1971).

2. Forman, J. A. S., and Fairbairn, E. M., *Social Casework in General Practice* (London: Oxford University Press for the Nuffield Provincial Hospitals Trust, 1968).

Change in the health professions

feature was the emergence in public of the resentment of some nurses and members of the professions associated with medicine against the position of the doctors. The doctors' unawareness of this depth of feeling, and later sharp reaction, was even worse. The question of paybeds is essentially political and will be decided in that arena, but it can do great harm in the hospital professional family if mishandled. The development of closer ties between the health professions will require understanding and a special effort on the part of all concerned, but especially from the medical profession. Without that improvement we cannot hope to get the best out of the restricted resources which will be available for the health service in future years.

The problem of inter-professional relationships deserves closer study than it has been given so far. The assumption of medical autocracy may be in retreat but it must be replaced by the recognition of more positive roles for some other members of the health team. To quote Erica M. Bates:¹ 'It is important to remember that someone needs to take over-all responsibility for each client or client group, so that clients are not left waiting between professionals, each of whom thinks the other is dealing with the problem.' That was written against the Australian background in which medical roles are less clearly defined than in Britain, but the analysis of changing professional roles has many applications to our own position. In my belief the doctor has a central, not a dominant, role which he can only fulfill successfully by recognizing the independent professional contribution of others from his own or related professions to one of whom he will cede the leading position on appropriate occasions.

1. Bates, Erica M., 'Changing professional roles in medicine', *Search*, 5, no. 10 (1974).

8

Progress by consensus

The changes in the National Health Service and in British medicine as a whole discussed in the preceding chapters came about in a variety of ways. It would be comforting to our self esteem if we were able to suggest that either the profession or the central departments had seen exactly where they wanted to go and, either by the leadership of one of them or jointly, they had proceeded along a clearly seen and chosen path. The health departments and the profession certainly played their complementary parts in the evolutionary process, but it cannot be claimed that the emerging pattern was seen clearly by either party at an early stage. A lot of different strands came together to make the pattern. That coming together was helped as much by the unexpected outcome of certain developments as by a deliberate attempt to advance the process.

Some deliberately planned developments proved, subsequently, to be misconceived. For example the Spens Report on remuneration of hospital staff suggested what looked like an orderly system of training posts which would lead the young graduate through to a specialist post with the implicit assumption that if he was not good enough, or perhaps was not willing, he could diverge at any point into general practice. Both the profession and the health departments accepted, even welcomed this tidy plan. It may have been acceptable at the time, but experience has since shown up its shortcomings which have been discussed in the previous chapter. It has now become generally recognized that general practice needs a much more orderly preparation than this would provide. When, twenty years ago, this subject was discussed between the DHSS and representatives of the professions, however, no GP took part; this had not been thought necessary by either side.

An important method of securing progress by consensus has been the use of working parties nominated jointly by the DHSS and the profession. These have usually been made up partly of

Progress by consensus

nominees of the profession, partly of department staff, and partly of consultant advisers of the department brought in as independent experts in their own fields.

The first example of this kind was a joint committee of the profession and the then Ministry of Health, established to review proposals for increases in consultant establishments. The rate at which specialist staff had been growing and costs escalating in some regions had caused concern since the early years of the NHS, and already a system of control had been introduced. Reviews of consultant staffs by teams of two retired consultants had shown how widely standards varied between regions and how regions with greatest attractions of other kinds tended to secure a disproportionate share of any increases that were available. The new joint committee, set up to review proposals for further increases, worked by consensus, and in the nine years that I chaired it there was no occasion for a vote. It continued to work for twenty years, and I believe with the same sense of common purpose throughout. It tried to rationalize increases in consultant staff in the regions, but did not operate in a restrictive way. Increases in shortage specialities were allotted selectively to applicant regions which were least well staffed. In other specialties, no reasonable application was refused. There can be arguments about the suitability of this particular method for securing fair shares. The committee simply advised on applications received; it could not seek them out from regions thought to be in greatest need.

Just what the future change in hospital staffing should be was the subject of protracted negotiations between the DHSS and the profession and it was eventually agreed that there should be another joint working party to report on medical staff in the hospital service. This was the working party chaired by the then President of the Royal College of Physicians, later Lord Platt; half the membership was nominated by the Royal Colleges and half by the two Departments (English and Scottish), but the Ministry of Health's nominees included two of its consultant advisers, appointed as experts not as representatives of the Ministry. In its report,¹ the joint working party suggested a review

1. *Report of the Joint Working Party on the Medical Staffing Structure in the Hospital Services* (London: HMSO, 1961).

Progress by consensus

of hospital staff, which was subsequently undertaken by selected experts in each region. From that review, a programme for the further development of hospital staff emerged. The report of the Platt Working Party did not commit either the Departments or the profession; but it was a valuable document on which formal discussions could take place. It is the first example in the NHS of the use of such a report not as a negotiated settlement but as the basis upon which a settlement could subsequently be developed.

Later, at the time of the great concern about the condition of general practice in the early 1960s, another joint working party, chaired by Sir Bruce Fraser, was established to look at the difficulties in general practice. That working party did not proceed to a conclusion because it was overtaken by the direct negotiations on the charter to which reference has been made in an earlier chapter. It did produce some ideas which were used in the course of the subsequent negotiations and helped in the development of a system of remuneration in general practice which assisted rather than impeded the best development of that pattern of practice. I can recall one occasion when my own thinking was suddenly crystallized on the question of providing practice premises while one loquacious member talked and talked. I was delighted to find my BMA neighbour writing 'yes' on the note I passed to him. We had moved in thought together, without utterance, in the way such things do happen when solutions are genuinely sought. This is not negotiation and it would distress the obsessed planners because the end-point is not envisaged from the start. But it is a collective thinking process which is a necessity in an organization like the NHS where anyone who knows all the answers has many of them wrong.

The joint working party method became fully established with what has since been known as the Cogwheel Working Party. The Cogwheel Working Party was set up to make recommendations on the organization of medical work in hospitals. It produced its first report in 1967 and in it recommended a new system of organization of medical work in divisions from which could be established a medical executive committee for each hospital group to act authoritatively on behalf of the staff as a whole. It is interesting to recall that sixteen years earlier a departmental

Progress by consensus

proposal based somewhat narrowly on the Chiefs of Service organization then existing in North American hospitals had been discussed with the profession, but had been rejected by them as a pattern for future development.

The recommendations of the Cogwheel Working Party were certainly an improvement upon this earlier suggestion; they were better reasoned and far less rigid. They were the views of twelve people who worked together as individuals, and not as delegates of the Ministry or of the profession. Indeed, amongst the Ministry's six nominees there were three people from outside it, two experienced in hospital administration and one a senior administrative medical officer. At the end of two years of intensive discussion and a good deal of visiting and taking evidence, the first of the Cogwheel reports was produced. It was deliberately a short report suggesting principles rather than attempting to set out details. It was distributed to all hospital doctors of registrar grade and above. Scotland had its own Working Party whose report was similar. During the next two years members of the English Working Party (lamentably there was no member from Wales) gave a great deal of time to attending meetings of doctors and of administrators throughout the country to expound the principles upon which the Working Party had agreed, and to discuss with those who might agree to apply them how best this might be done. Not all the points made in the report proved acceptable, but its broad principles were adopted in a large number of hospitals.

The report had been made jointly to the Minister and the Joint Consultants Committee who quickly agreed to publication before either a departmental or a committee view had been decided. There has been no attempt to impose the recommendations. The ideas were not entirely original since developments began in a few hospitals, notably the Manchester and Birmingham teaching hospitals, on the general lines of the Working Party's conclusions before the report was published. Even with all the care taken over the launching of the report mistakes were made. The administrators in one northern region had their copies on the right day, but copies for the doctors all arrived mistakenly in Truro. The worst oversight was failure to send copies of the report to matrons of even major hospitals.

Progress by consensus

The Working Party continued in existence and produced a second report four years after the first in which it could show that the majority of the larger general hospital groups had adopted its suggestions, albeit with a wide variety of modifications. It was able to accept that some of the elements in its original proposals were not suitable for general application and in its second report it suggested ways in which arrangements could be improved.

A third report has since been produced at the time of the re-organization of the NHS, recommending further developments in the use of the Medical Executive Committee and divisional systems and the ways in which they should relate to the new administration. The third report especially called attention to the need for more objective examination by medical staffs of the quality and effectiveness of the work they do. For this third exercise the Working Party was reconstituted with a new and substantially younger membership: only two of the original members remaining. The younger element was introduced from both sides and this in itself is an interesting example of the way in which the profession has come to accept that its younger members may indeed have as much to contribute to progress as those of longer experience. The Chief Nursing Officer of the DHSS also took part in most of the meetings.

What has been suggested by the Cogwheel Working Party¹ in its three incarnations will certainly be subjected to considerable modification with the passage of time. The main point I wish to make is that in this situation, away from the negotiating table, it is possible to obtain considered views not tied to an 'official' professional or departmental position. A consensus achieved in this way can be presented as suggestions which the profession and the administration may subsequently be able to apply. No one in the discussion is bound by a predetermined policy and there is full opportunity for discussing the published conclusions, which need not be accepted in full, or at all.

During 1973 there was also a joint working party which, by similar methods, reviewed certain aspects of the organization of general practice. The Working Party examined the importance of

1. *First, Second, and Third Reports of the Joint Working Party on the Organization of Medical Work in Hospitals* (London: HMSO, 1967, 1972, 1974).

Progress by consensus

providing diagnostic services for general practice, a development not always welcome to hospital staff; it also made recommendations¹ about steps which might help to preserve continuity of care paying special attention to deputizing and appointment systems. These views have been published and it will be interesting to see whether, in the less regulated field of general practice, they can be the basis of further development.

Of course, the working party method is not suited to all situations. It cannot be a substitute for negotiation, which is always needed on such matters as terms and conditions of service, particularly remuneration. The problem of the hospital staffing structure, for example, was not resolved by a working party which was asked to define the responsibilities of the consultant grade.² Representative negotiation had led to proposals which the profession rejected. The Minister thereupon invited a number of people to serve as a working group to review the problem. The membership, which was not suggested by the profession although there was consultation about it, was not as well-balanced as it might have been. Although the conclusions of the working group largely found their way into the subsequent agreement secured by negotiation, the report was widely criticized by senior hospital staff and formally rejected by their representatives.

There are many other occasions when a suitable group is convened to discuss a new development or a particular problem within the service. The Nuffield Provincial Hospitals Trust and the King Edward's Hospital Fund have made notable contributions by organizing symposia or working groups for this purpose. The Trust in particular has arranged the publication of a number of valuable studies on problems and progress in medical care, even including detailed studies of the research programme of the DHSS. The King's Fund Centre (formerly the Hospital Centre) and the King's Fund College have both been used to promote discussion of problem areas and demonstration of successful solutions.

The use of working groups and symposia to reach consensus on new developments is also important in the clinical field. Replica-

1. *Report of the Joint Working Party on General Medical Services* (London: HMSO, 1974).
2. *Report of the Joint Working Party on the Responsibilities of the Consultant Grade* (London: HMSO, 1969).

Progress by consensus

tion of new clinical methods is usually achieved by publication of results followed by discussion within professional forums supplemented, if necessary by visits and consultation. When more formal arrangements are needed to achieve progress in professional matters, the appropriate college or association usually takes the lead. For example, the Royal College of Physicians and the Royal College of Surgeons in a joint committee studied the need for provision for surgical replacement of heart valves and a number of other problems involving both medical and surgical cardiology. The BMA Planning Unit produced excellent reports on primary care and on intensive care units. And few professional reports have ever had such worldwide impact as the two RCP reports on smoking and health.

A more important and regularly used method is that of a special conference called by the Medical Research Council. Often a conference with a selected membership called in this way leads to the production of a published report. Sometimes an unpublished report may be provided for the Council suggesting directions in which support for research might be most fruitful. Usually the Council invites a departmental observer or member if there are service implications.

Fortunately relationships between the MRC and the DHSS have always been close, and now with the appointment of a Chief Scientist, himself formerly chairman of the Clinical Research Board, that relationship is closer still. The Chief Medical Officer of the DHSS was formerly an assessor and is now a member of the Council, and in my own experience the privilege of attending Council and Board meetings for thirteen years was one of the most highly valued of that office. Following the Rothschild Report and the discussions about the organization of government-sponsored research, the DHSS has become the channel through which a part of the funds devoted to medical research managed by the Council reaches it. That arrangement was only reached after a great deal of public discussion in which emotion was sometimes more prominent than reason. Yet we have to recognize that, as in the provision of health services, it will never be possible to find all the resources of trained staff, money, or physical accommodation which could be used for the promotion of medical research. The

Progress by consensus

cost, complexity, and range of research in the biomedical field is now so great that some selection must be made, if research is to be prosecuted with reasonable support in the areas where the need and potential value are the greatest. A satisfactory method of working has been evolved and there is not the slightest indication that scientific freedom has been lost in the process.

Sometimes, even in the clinical field, the DHSS may be the only central body able to call together an appropriate group and meet its expenses. Moreover, when subsequent developments may lead to substantial new demands on resources, the DHSS for that reason alone must be involved. Over the years the DHSS has invested a considerable amount of money in the development of new equipment. For many years there has been a working party dealing with the development of laboratory equipment, and latterly with automation of laboratories. Even before the NHS there was a working party considering the development of breathing machines, at a time when the main apparatus available consisted of Drinker respirators provided through the munificence of Lord Nuffield during the 1930s. The epidemic of poliomyelitis in Denmark in 1952/3 with its heavy toll of respiratory paralysis, led to the rapid development of a technique of maintaining respiration by intermittent positive pressure and to the production of apparatus for this purpose. One of the first large conferences organized in the Ministry¹ for the discussion of a new clinical requirement was of representatives from the different regions to discuss what might be needed in England should an epidemic similar to that which occurred in Copenhagen develop in this country. A team was sent to Scandinavia to evaluate the new positive/negative pressure respirator and some were purchased for trial in Britain. Some of that apparatus is still in use, though not for the original purpose because the advent of poliomyelitis vaccine removed that particular need. Much larger programmes concerned with radiographic equipment and computers were only possible because of voluntary help from the profession.

Conferences were also called by the DHSS with the concurrence

1. The Ministry of Health was joined with the Ministry of Social Security to form the Department of Health and Social Security (DHSS) under the Secretary of State for the Social Services in the Autumn of 1968.

Progress by consensus

of the Standing Medical Advisory Committee and the Royal College concerned on such questions as prophylaxis against tetanus, the treatment of renal failure, the provision to be made for transplantation of kidneys, the provision of intensive care in myocardial infarction, provision for out-patient surgery, and the management of meningo-myelocoele in the newborn. These were instances where consensus was a prerequisite to progress, because the redeployment of resources or changes in clinical practice, or both, were involved.

This pattern of discussion in joint working parties, in which the professional membership is always in the large majority but in which informed non-medical views are also represented, has proved its worth. It has been, and continues to be, a valuable means of promoting advance by agreement rather than the dictate of closely formulated central plans. The joint working party method must be used circumspectly and with agreement and understanding in the profession and the DHSS alike. The medical profession has shown many times its hesitancy in committing itself to accept the conclusions of a delegated few. One of the great advantages of a working party of this kind is that it can be given information freely either from the DHSS or from the profession without any risk of breach of confidence. It then provides an opportunity for the co-operative spirit which the profession always shows when faced with problems of an essentially professional kind. The Council for Postgraduate Education had its origin in a conference called by the CMO at the request of the Standing Medical Advisory Committee. The Brynmor Jones Working Party on the GMC was the outcome of a similar informal conference and its secretary was an SMO in the DHSS. It is possible for the profession, the Universities and the DHSS to share common objectives—indeed it had better be!

Resources for health care

The NHS in Britain spends about one-tenth of our national budget. In the straitened circumstances at the time of writing, it has suffered less reduction than some other areas of government expenditure. It is perhaps less able to withstand cuts than other services because additions to our health budget since the inception of the NHS have not matched the changed pattern of need for health care, and the ability of the health professions to meet it. Twenty-five years ago a Chancellor of the Exchequer announced that the cost of the NHS must not exceed £400 million. Its cost at constant prices is nearly three times that already, but it could use far more. Other countries increased the proportion of their gross national product applied to health services at a faster rate while we relied on more effective application of what we had. Whether and when Government will be able to increase the allocation to health must be left to them to decide against the background of the national position. Inequalities in the present allocation of funds between different parts of Great Britain call for selective increases if and when that time comes.

The inequalities in England and Wales are well-known and some attempt has been made through selective use of capital allocations to reduce them. At the inception of the NHS, the West and North Midlands, parts of Yorkshire and Lancashire, and Northern Ireland had great shortages of hospital building. But Wales had the greatest need for new hospital provision of any part of the country, and it was given precedence amongst the early developments. The New Towns, with their fast expanding populations, also had to be given something. Harlow, Welwyn/Hatfield, Stevenage, and Crawley would have been destitute otherwise. In a region like Oxford, however, the rapid growth in population could at least partly be catered for by more intensive use of the relatively satisfactory accommodation at some main centres there.

Resources for health care

In some parts of England the shortage of hospital building was compounded by the low quality of much that was available. So far as the worst buildings were concerned, there would have been little opportunity even to spend more money on maintenance had additional funds been available; replacement was the only solution. On the other hand, it is almost impossible to organize services within such buildings without disproportionately heavy expenditure on staff.

At no time has there been a drive, using extra central funds, for levelling up in the least well served areas. Regions with greatest deficiencies in hospital buildings stood to benefit from selective allocation of capital in the earlier stages but they did not always use the addition then because they were slower into their stride on building work. Richard Crossman, in his posthumously published diaries, mentions in early 1965 the 'huge hospital building programme'. In fact it was not huge in relation to need but pitifully late and small, and the twenty-year gap in hospital building meant that know-how had been lost. Health centres were also needed but not wanted by the professions in the early years; only seventeen were built in fifteen years. In any case, health centre provision was a local health authority responsibility in England and Wales. Even at a time when least well doctored areas were losing GPs and provision of health centres might have helped to attract more, there were no central funds to be used for the purpose. Scotland and Northern Ireland were better placed in this respect.

With an over-all shortage of funds the DHSS has almost inevitably operated by trimming regional programmes. Acute general hospital services are the most intensive users of medical resources and are most likely to be associated with new and costly scientific advances in therapy or diagnosis. Although they use only two-fifths of the beds they receive nearly 95 per cent of the admissions and practically all the out-patient work. Their needs were the most likely to be urged by the health professions collectively; and this has occurred. Hospital services for the mentally ill and the chronic sick lacked such an effective voice. Occasionally, however, the DHSS was able to obtain extra funds for geriatric, mental illness, and mental handicap services; other services such as intermittent haemodialysis, and cervical cytology have also

benefited in this way. The administrative pattern of the NHS was better adapted to pressing the claims of hospital services on the DHSS than those concerned with family practitioner services. On the other hand, local health authorities were in a position to use their own funds and press their own case for services for which they were responsible. It was not until April 1974 that one authority could speak for the needs of all services in an area.

In 1971 a new formula for allocating funds for hospital services was introduced. It was based only on population and certain factors related to existing hospitals and their use. It was designed to remove inequalities over a period of ten years, but Noyce *et al.* (*The Lancet*, I, 554, 30 March 1974) have criticized its lack of relation to factors of need such as are used in calculating the rate support grant. This paper also analysed all health revenue expenditure by region in terms of population and showed that Sheffield (now Trent) Region fared worst with East Anglia and Birmingham next while the Metropolitan Regions did best, followed by Liverpool. Had Scotland and Wales been included in this comparison it would have been seen that Wales by some 4 per cent and Scotland by 20 per cent received more than the England per capita average.

The new formula for distributing funds will inevitably squeeze the better-off regions. One can certainly understand the difficulty that some people have in accepting that necessary improvement for regions, which have been clearly receiving too little, should be at the expense of better, but insufficiently high, standards elsewhere. Those in the regions more fairly treated in the past would naturally object strongly to losing funds they believe essential for their own work in order to help colleagues. That would be no less resented by any other group of people. Doctors seem to have been unaware, however, of the inequitable treatment of some parts of England and certainly have not used their collective voice to secure remedies. But, in the hard times ahead, it is to be hoped that the profession will come to recognize the need to use its influence to obtain better treatment for areas where the shortfall in health care resources is greatest. It is not surprising that some of these areas have the worst indices of health.

A comparison of national expenditure on health for some

Resources for health care

countries of Western Europe, the USA, and the USSR made in a survey by Robert Maxwell sets out the wide differences between the proportions of gross national product spent by different countries on health, as had been done earlier by Abel-Smith in a WHO report. Yet the differences in national morbidity and mortality statistics are on the whole not to the disadvantage of Britain, despite the lead held by the Scandinavian countries and the Netherlands. Whether this is related to the changes in the health care delivery system in Britain which may use the resources available more efficiently, no one can say. The differences may only reflect the point which is well made in the Canadian working document *A New Perspective on the Health of Canadians*,¹ that the major factors in promoting health are those concerning life-style and environment rather than technical medical care.

The NHS happens to have made it possible to use preventive methods such as vaccines and improved antenatal care without greatly increasing the cost of the NHS in the way that some of the technical developments in medical diagnosis and treatment do. Maxwell makes the point that 68 per cent of the revenue costs of the health services in England and Wales in 1971/2 was attributable to salaries and wages. In other countries it is often more, as Britain does not have a high proportion of professionally trained health workers to population compared with the other countries whose expenditure is quoted. Moreover Britain has a lower proportion of doctors in the medical and surgical specialties and a higher proportion in general practice than the other countries for which the analysis was made.

The NHS, as mentioned earlier, helped to sharpen the distinction between specialist and generalist practice in Britain and to bring about a health care system in which a partnership between the generalist and specialist is accepted and extended. This could mean, in comparison with North America, that specialist work is wholly in the hands of staff working exclusively in specialist fields and using their time more economically because it is predominantly spent in one hospital or at most in very few. Consultative work is not undertaken in doctors' offices but in organized consultative out-patient sessions at the hospitals, and this must provide

1. Lalonde, M. Department of National Health and Welfare (Ottawa, 1974).

Resources for health care

a more economical pattern of working than would be found in, for instance, Australia, New Zealand, or the Federal Republic of Germany. It is a pattern none the less that I have heard castigated by a leading German physician as too mechanical and delaying for the patient.

A satisfactory relationship between nurses or midwives working in hospital within the specialized service and their colleagues in the community is equally practicable. The grouping of nurses in the community on the basis of health centres or group general practices makes this easier as well as facilitating the collaboration between doctors and nurses. While these functional arrangements undoubtedly exist, and have been improving with the support of the professions concerned, it can only be an assumption that they are responsible for a more effective use of the health care system.

The Canadian working document mentioned above puts forward a 'health field concept' made up of four broad elements: 'human biology, environment, life style and health care organization'. It is remarkable that the logical conclusion of this working document would be very close to a system such as that brought about, pragmatically, in the NHS. In Sweden the plan for the future as described by Professor Bror Rexed at a recent conference is almost identical to the British except for the concentration there of much of primary care in health centres to be located at district general hospitals. The British variant of having a number of smaller health centres distributed through the community, relating to where people live rather than to the technical medical centre, is not different in principle. The changes in our pattern have evolved slowly and were not deliberately planned as a whole. There may well have been practical mistakes in the course of development over a twenty-six-year period but the outcome seems to be broadly acceptable in principle as well as effective and economical in practice. It offers a framework for future development which may be modified, but seems unlikely to be discarded.

The amount of money available to the NHS must set limits within which development can occur, but it need not affect the principles upon which that development will proceed. The earlier examination of health centre development has shown how change in the financial process can release the opportunity for a profes-

Resources for health care

sional development, the need for which had not been generally accepted before favourable financial arrangements made it practicable. Nevertheless a new functional pattern, once accepted, should be capable of rapid achievement if efficient plans for its realization are made. In the case of health centre development, for example, that acceleration would have been more readily achieved if the objective had been as clearly stated as that propounded in the Hospital Plan of 1962.

The process by which the Porritt Committee reached their conclusions about the need for a unified administration of the Health Service does not seem to have included a clear appreciation of the district complex that has since emerged. Nevertheless, the Porritt Report did put forward principles which would help the emergence of a satisfactory district pattern and provides an excellent example of the way in which, step by step within a comprehensive health service, a satisfactory development plan can emerge. Planning developed in this way has the added benefit that there is no vested interest in proceeding upon rigidly defined lines.

The precisely defined plans of the early days of the health services in the USSR were essential to development in a disorganized situation and have achieved remarkable results. They may be an impediment to subsequent change, particularly when some of the concepts about the over-all need for rapid growth in professional staffs may more readily fit in with the aspirations of those professions than with the practical needs of the people. At the other extreme, a social setting in which government intervention is mainly limited to assisting the public to obtain health care in a market situation makes sound functional planning much more difficult. Hetzel in *Health and Australian Society*¹ makes the point that a system based on fee-per-service payment can complicate the functional planning of services and make them prohibitively expensive. The same point is made in the Canadian working document referred to earlier.

The purely 'market' situation in health services allows selective use of scarce and expensive forms of medical care, because those who can pay do so and those who cannot go without. The national services in Britain, Scandinavia, and Eastern Europe,

1. Hetzel, Basil S. (London: Pelican Books, 1974).

Resources for health care

attempt to meet all needs for all the people, but within the finite limits of available resources. Most countries have health services which fall somewhere between the extremes and even in the predominantly free enterprise situation there is usually deliberate intervention to meet particular needs. Even the African countries with the smallest resources have mounted successful smallpox eradication campaigns.

Since no country has the resources to meet all needs, deliberate choice of priorities has become essential. We have had such selection in particular fields of medicine before. The decision to undertake a campaign for immunization against diphtheria in 1941 when resources were severely restricted was fully vindicated by the result. The decision in 1946 to use limited supplies of streptomycin for the early and most hopeful cases of tuberculosis and, five years later, to restrict the use of cortisone to special centres were justified by the world shortage. Now we have to decide how we shall direct our over-all effort because we know that we cannot respond to all needs, much less demands.

In most respects the development of the NHS has been a continuous process analogous to organic growth. But a service that has grown in this way cannot be pruned as if it were a shrub. The incremental method of distributing the growth money selectively has been used in a limited way but despite the more than two-and-a-half-fold increase in expenditure in real terms it cannot be claimed that a clear selection of priorities has informed its use. Some developments—of specialist staffs, group general practice, psychiatric units in general hospitals, district general hospitals, postgraduate medical centres, 'attachment' of nursing staff to group practice and health centres—are attributable to selection of priorities. But such selection of priorities (unlike the earlier examples of immunization and selective use of new drugs) has been in general terms and encouraged rather than imposed. It is at the district even more than the national or regional level that the ordering of priorities has been least effective, partly because of the former tripartite structure.

Health care planning teams should be able to make better-informed choices and the district management teams to put them into effect within the limits set by resources. Since the resources

Resources for health care

are unlikely in the near future to be increased so as to raise those of England and Wales to a level more nearly equivalent to those of Scotland, or of the Trent or Birmingham regions to those of the Thames regions, improvement will depend more than ever on using efficiency and economy to reduce costs in one service field so as to make funds available in another. Most forms of health care can be provided by different combinations of the resources of in-patient, out-patient, and home care with small or no disadvantages from a particular choice. Many examples could be given from medicine, surgery, gynaecology, obstetrics, and psychiatry and some have been quoted earlier. Changes may involve discarding or modifying some cherished medical, nursing, dental, pharmaceutical, or medico-social practices. No health professional should expect to continue a needlessly costly practice simply because he or she is set in his or her ways.

When a standard hospital medical record form was proposed some years ago I received personal letters from individual irate doctors violently resisting a change which had been recommended by a committee mainly composed of their clinical colleagues and which might have saved large sums in a year. The resistance to standardization of nurses' uniforms was no more rational. We cannot afford such foibles now.

There are some 68,000 doctors in Britain, four-fifths of them actively practising in the NHS. There cannot be 55,000 choices of direction nor indeed a few hundred. Within national policies—such as should be capable of agreement between the professions and the health departments—regional, area, and district plans made after similar consultation should be applied on the basis of deliberate choices. The key to this lies in the district, where also the community health council can speak for the consumer view. Within the district, doctors must come to rely on their chosen spokesmen to secure the best results within the resource constraints. In their own practices all doctors will need to be guided by the knowledge that they can only bring about greater expenditure on treatment, diagnosis, or other care at the cost of some other part of the service in which they may also be interested. A needless use of a hospital in-patient day, an unnecessary laboratory test or X-ray, a drug which is more expensive but not more effective than an

Resources for health care

equivalent or which is inappositely used, should all be costed in terms of some other patient's loss.

The most difficult decision for some medical groups will be that to forego an attempt to make some further scientific advance. Ivan Illich¹ overstates his case, but there is a case none the less. Elaboration of investigation or therapy may lead to some new insight into a disease or disease process which can later be applied to many patients as well as to the particular patient under care at the time. But it may merely add to an already baffling mass of knowledge confirming what is already known without advantage to the patient. It may even expose him to added discomfort, even risk, without benefit. The mere accumulation of interesting information at cost to the service and perhaps of the patient's time is not justifiable. A technical achievement without prospect of benefit to the particular patient in comfort or survival should not have been attempted. Twice in my own family I have had cause to be grateful to doctors who have deliberately withdrawn from a therapeutic forlorn hope—to the patient's comfort *in extremis*. It is not always so. These are very onerous decisions which only clinicians can make: there are no rules. It is in the establishment of policies on such questions, humane and economic, that the group can be most valuable in support to colleagues.

1. Illich, I. *Medical Nemesis* (Calder & Boyars, 1974).

Change in clinical practice

ADVANCE BY AGREEMENT

The demand for health care can extend almost without limit and that extension can be increased by the new contribution that medical science will constantly make available. Some of those contributions may have the effect of reducing the over-all demand on trained time and money and may lead to cures which we cannot now foresee. Such advances could make the problem of decision relatively simple, but advances that mean committing a larger share of resources to any part of the health care field do require decisions in which the health professions and the administration of the NHS have to join, in order to reach conclusions. The NHS began in a pattern which assumed that each participant would be enabled to do for his patients all of which he was technically capable. Now that the limits of what is technically possible are beyond the possibility of achievement by the staff and resources available, the ways in which the service offered must be limited require understanding and agreement, not unilateral demarcation.

In considering how that agreement can be reached there is as always, something to be gained by looking at the way in which it is done in other places. The simplest and most direct example is that of the USSR. There, the health care system has developed according to a plan which has advanced with the growing capacity of medical science. The first Health Ministry of the USSR produced an over-all plan which was developed downwards by ministries of the constituent republics through the *oblasts*, which correspond roughly to our regions, to the *rayons*, which correspond roughly to our districts. The guidance disseminated from the centre was more direct and in more specific detail than anything that has been done under our own NHS; but it was devised in circumstances very different from our own. The plan has evolved with time, but the broad intent and method remain.

Change in clinical practice

Within the special fields of medicine, the central research institutes produce guidance that almost amounts to clinical directives for those at the periphery. By this means, standard methods devised after consultation with the experts in any particular field are made generally available. This seems to be accepted within a system which needed such direction in its beginnings and has been accustomed to detailed guidance and monitoring of performance from its early days. The centre enjoys not merely more authority but also more uncritical respect than would be given in Britain.

CLINICAL FREEDOM

It is unlikely that a system of this kind would find much favour in Britain. On the other hand, complete freedom of action for everyone—the clinical freedom which the profession has rightly prized—inevitably comes under some limitation when resources are so limited as to require the most economical use of that which can be provided. I recall for instance an actual case of a practitioner who in a single year prescribed tetracycline for topical application to varicose ulcers in amounts which brought his total prescribing to £36,000. He genuinely held the view that this was right and beneficial to his patients and was only deterred by disciplinary action that made it impossible for him to continue without extreme financial loss. There is machinery under which the profession itself decides whether disciplinary action in such cases is reasonable. But such extreme measures are not often needed. Control of excessive drug prescribing in the general medical service is mostly through advisory visits and discussion; and a quite substantially raised level of prescribing has to be reached before even that measure is taken.

In hospital, there may be scrutiny of the total demand for expensive drugs as a means of keeping spending within the hospital budget. Prescription of some substances may require a personal order by the consultant, and committees of medical staff may use persuasion to control what appears to be excessive expenditure. It is, for example, often possible to use one of the less expensive anaesthetics and the anaesthetists in a hospital district could agree amongst themselves on some voluntary limitation of

Change in clinical practice

use of the most expensive. Similar considerations arise over the ordering of other supplies including expensive equipment. The best way to secure this sort of self discipline is through the machinery by which the medical staff manage themselves. The Cogwheel organization, discussed earlier, is well suited to such questions as this. The significant change for the medical profession in such arrangements is that they delegate to a smaller group, answerable to the whole, the authority to introduce control. That group also works with a district management team with wider authority over resources.

The new administrative system will make it easier for hospital and community services within a district to be more closely blended. The district management team (DMT) manages the resources available to the district; it operates by consensus and, in medical matters, with the help of the district medical committee. This does not mean intervention in the clinical responsibility of individual members of any of the health professions. The DMT controls the availability of resources used in the discharge of that individual clinical responsibility; the effect of its decisions is indirect and on general lines. The health district plan, within which the DMT operates, will be constructed with the help and advice of widely representative 'health care planning teams'.

Competition for scarce resources, which will continue for the foreseeable future, gives scope for differences among the health professions to impede the joint effort that is required. The allocation of resources is largely determined by the clinical decisions of doctors and dentists, and understanding of that fact and the responsibility it imposes is very much needed. This involves departure from the traditional, absolute independence of the doctor and acceptance in some areas of work that policy agreed by the group will inevitably place some constraints upon him. The individual doctor must, of course, aim to do what he believes right for the patient in his care at any given moment. But in dealing with the problem immediately facing him he must have regard to the effect of his decision on what may be available for other patients in the community. If that is an encroachment upon clinical freedom, it is an inescapable encroachment.

SELECTION OF PATIENTS FOR TREATMENT

The dilemma is exhibited starkly in the treatment of renal failure. At present in Britain we are trying to treat patients who come within a particular age bracket and who have from their medical condition and their circumstances the best prospect of being able to maintain regular treatment. This involves problems which are social and psychological as well as medical. Not all the patients whose lives could be prolonged by intermittent dialysis will be manageable within the resources of the programme which now exists. Even if that programme is expanded substantially it would simply extend the boundaries for selection and increase the difficulty of the decision.

So far the decision has been left in medical hands, so that the doctors can choose those patients whose treatment offers the best chance of continuing success. In some other countries there have been attempts to establish some sort of joint medical and non-medical jury system to make the final selection. It has been suggested that value judgements about the contribution the individual may be able to make to the community or his family are better assessed in such a way. There have been suggestions for similar selection procedures in this country, but they have not been welcomed.

In renal transplantation there is the same kind of selection problem and an added technical difficulty. It is generally accepted that the survival of the homograft can be affected by the closeness of the match on immunological grounds. A perfect match is rarely possible save with identical twins, but a mismatch limited to one or two factors may be possible. We now have a tissue matching service in Britain and at an even earlier stage there were tissue matching services in Scandinavia and in Western Europe. We have benefited from exchanges with other countries and have contributed graft material to them. If such a matching system is accepted, it can be operated on purely objective grounds. The medical people responsible must then accept that they may have to contribute a particular donor organ to a patient not under their care because he is a better immunological match. They may in turn benefit by receiving a donor organ from somewhere else.

Change in clinical practice

The inadequacies of our system for obtaining cadaver organs have been sharply criticized in a report of the Transplant Society¹ but that can be remedied and the problem of selection still remains.

A different problem of selection for treatment arises in the case of surgery for spina bifida. By about twelve years ago, the surgical treatment of spina bifida using the Spitz-Holter valve had been developed at a limited number of paediatric surgical centres. Enthusiasm for surgical intervention in the neonatal period went so far that a number of infants' lives were preserved when the human outcome could be, in the view of many, even more tragic than the otherwise inevitable early death would have been. With great effort the early deaths of some very severely handicapped infants were prevented, to leave a growing child with gross physical and mental handicap, unable to lead anything approaching a normal life and subjected to repeated surgery. The revulsion against this radical surgical approach, a revulsion in which Dr John Lorber in this country played so large a part, suggested reconsideration. The Standing Medical Advisory Committee recommended a multidisciplinary conference which was held in the DHSS with agreement of professional bodies concerned. A small group was chosen from the conference and, under Dr Brimblecombe's chairmanship, it produced recommendations for the future to be considered by the Standing Committee. A memorandum endorsed by the Committee was circulated to all GPs and paediatricians. How large a part this central professional guidance played in the sequel no one can be certain, but it is a fact that early deaths from spina bifida increased, roughly from the time of publication, and this can only be attributed to a more understanding and humane policy of selection for surgery. Here the original impetus came from within the British Paediatric Association and the British Association of Paediatric Surgeons. It was taken up by the SMAC, carried on by the DHSS and returned to the SMAC for final authority.

It should be emphasized that in developments of this kind there is no question of departmental instruction. The health departments do have an opportunity of providing a forum in which professional views can be formulated and it is often important that that

1. *Br. med. J.* 1975, 1, 251.

Change in clinical practice

forum should be multidisciplinary. One of the best contributions to the conference on spina bifida was made by a physiotherapist. In some countries explicit instructions would be given from the centre, but in such a matter it is the persuasiveness of the argument that will determine the humane revision of local policies by the professionals directly concerned. There is a temptation in a national service to cut corners and to direct rather than to persuade. There must surely be enough examples of the mistakes that can be made to dissuade anyone from wishing to do that. Selective broad-based consultation can lead to the formulation of reasoned advice which will help in decision-making locally. It should never be forgotten that these decisions locally depend not merely on the view of a single doctor but on contributions from his colleagues in his own and the other health professions, and finally upon the understanding and acquiescence of the parent in this case or the patient in another.

Fortunately, decisions on patients with renal failure or babies with spina bifida are not those which are commonly required. Decisions on less precisely defined problems affecting a far larger number of patients have to be made in every district. One of the oldest differences of opinion concerns the need for tonsillectomy and neither SMAC nor MRC has been able to resolve it. The questions range from selection of the households to receive domestic help, because more need help on account of illness than can be given it, to choosing whether operation on a child for squint should take precedence over treatment of an old person needing removal of cataracts. Future decisions on priority may be less easy than this. Where they involve the disposal of material or human resources which could otherwise be used in a variety of ways and for the benefit of different patients, the considerations are not purely professional. They will cross the boundaries between specialists and between professions and they may involve considerations of the possible use of the same funds for purposes which are more social than medical. Changes of that nature can usually be arranged amicably at a local level where there is understanding between people well known to each other. That understanding involves the health authorities and administrators as well as the medical, nursing, and often other professions; it also often

Change in clinical practice

requires sensitivity to local opinion. Platt, Hill, and Fletcher have all touched on this point in previous Rock Carling Monographs. Problems are most likely to occur if either management or one or other of the professions adopts a dictatorial line. Fortunately, the assumption that the medical decision will always be final is not so commonly encountered nowadays as formerly. But, as Erica Bates has emphasized, that must not leave a void with no one accepting responsibility. It often happens that the final judgement is medical, but it should reflect a consensus, not an arbitrary decision, where others are involved.

THE DEVELOPMENT OF SPECIALIST TEAMWORK

The development of specialist work has become progressively more complex. Some of the more complex professional work had to be developed by teams involving surgeons, physicians, physiologists, pathologists, radiologists, and often scientists and technicians. Without the development of such teams, success in the application of a new technique or even perhaps the use of a new drug could not be expected. The evolution of cardiac surgery is an example of this.

In Britain open-heart surgery made considerable progress before the development of extra-corporeal circulation because of the quality of the anaesthetic service available here and the widespread use of hypothermia for the periods of operative work within the heart it allowed. For that reason such relatively short procedures as the repair of auricular septal defects were developed as rapidly at many cardiac surgical centres in this country as in any other. The development of extra-corporeal circulation to be used with elective cardiac arrest was a much more complex procedure requiring teams of anaesthetists, surgeons, cardiologists, clinical physiologists, and technicians contributing to various parts of the work. The number of units in Britain where such work could proceed with real prospect of success was small and they required selective financial support, most of which admittedly came from voluntary sources. Half a dozen of these succeeded in differing ways but the concentration of large resources on the unit at the Mayo Clinic, using a particular pump and oxygenator finally led

Change in clinical practice

to a standardized procedure which many other units then applied.

The cost of equipment and the team is sufficiently heavy to preclude widespread development, but the limiting factor is not simply cost. Such work must be done sufficiently frequently to develop and maintain expertise in it. Too many teams each doing too little work would all be less than efficient. Change in this highly expert field of surgery has become a matter of organization and financial and scientific support which is only practicable at a limited number of places. The amount of work required is itself limited and this in turn requires concentration. Change in such medical development is only practicable with resources, teamwork, and the manpower behind it. We have passed from the day of the individual feeling his way forward except in the specially prepared scene which Kirklin enjoyed at the Mayo Clinic and British teams in London, Birmingham, and Leeds. Later, in this this same specialty, concentration was to be required again for other special procedures in the very young and for valve replacement and pacemaker insertion.

In orthopaedic surgery there have been many earlier examples of local development, from the work of Hugh Owen Thomas and later Robert Jones up to the work on hip joint replacement by Charnley. The work at Wrightington is a particular example of the kind of development which can occur within a National Health Service and without the concentration of resources of a Mayo Clinic. Indeed there are two centres of international repute for this work in Britain, the second at Norwich, and neither was in a teaching hospital or given more than the backing one regional board could afford.

Corneal grafting was developed similarly at East Grinstead where one of our leading plastic surgical centres had grown up during the war. That development even required amendment of the law concerning removal of cadaver eyes: an amendment obtained through a Private Member's Bill. A national service need not destroy initiative.

PRIORITIES IN MEDICAL CARE

The problem of developing a new service becomes even more difficult when, as now, there is great shortage of funds. In such circumstances it is understandable that many specialists not directly interested in some new development should resist the use of scarce funds for a particular narrow field, possibly at the expense of developments in which they themselves are interested. The problem of securing such changes is one of securing understanding and agreement within the service and at the health departments. In present circumstances, any substantial funding of a particular development must usually be at the expense of some existing activity. This is not necessarily harmful to the NHS.

It is quite possible for some particular service to continue past the time when it has full usefulness. For instance the rundown of sanatoria went far more slowly than it need have done. The number of tonsillectomies done each year has decreased by a third, but the rate was more than three times as great in Wessex as in the Sheffield Region in 1972. The average length of stay of a patient with hernia was one-third greater in the Leeds Region than in the Oxford Region in the same year. These random examples suggest that there may be real opportunities of saving. What is necessary is full understanding of the meaning of selection of priorities. It means selecting one thing rather than another and it may well mean reducing activity in which some people have a special interest which they will naturally defend to the limit. We are long past the time when it is possible to provide all kinds of service that could conceivably contribute to the health of the public.

It is sometimes implied, if not actually said, that the great cost of the health service and its rapid increase derives from the diversion of more and more resources to exotic activities and to the treatment of unusual conditions in hospitals for the acutely ill. This is not so. It is the commonly occurring conditions which call for and exact the greatest expenditure. The treatment of each patient costs less if he is having a hernia repaired rather than having a heart valve replaced. But the number of patients requiring the repair of hernias runs into six figures, whereas the cost of all the

Change in clinical practice

heart valve replacements in a year might well be less than the cost that has been saved by the reduction in the number of admissions for the treatment of varicose veins to which I have referred earlier, provided the initial result lasts. It is, of course, right to consider whether such savings are best used in this way and equally to question their use for some other 'exotic' purpose.

If the pursuit of the unusual impedes the treatment of the ordinary case, then the justification for it should be closely examined. The extreme example of such a procedure is heart transplantation. There is a lot of cardiac surgical work to be done; much of it offering prospect of a normal or near normal life for a young patient whose life will otherwise be limited in scope and possibly short. Some of it can be delayed only at risk of the lives of patients. Some of the earlier exercises in heart transplantation immobilized for appreciable periods resources which could have been used for other more certainly successful work. Even if that is now less certainly true, the chance of a successful result for the patient may be too small to justify the imposition of any delay on some other work. That assessment is primarily medical and the advice that was given two years ago against diverting resources required for other purposes to work on heart transplantation was given by a medical group. Few decisions are as clearcut as that.

The decision not to pursue a particular line of medical or surgical investigation which may involve heavy cost can have related effects on the development of other work in the same centre with a more direct impact on the care of a much larger number of patients. Failure to provide for haemodialysis might have meant failure to develop regional centres for nephrology, with consequences for improving the care of other patients with kidney diseases throughout the region. It would certainly have prevented development of kidney transplants. The decision to organize a national programme for haemodialysis was an example of specific central action. A small number of research centres in close touch with the pioneering work in the USA elsewhere developed limited local services. The time came when the possibility of expansion of those services nationally by the development of the regional centres could be realized. An expansion of that order involved the provision of large resources and it was a central

Change in clinical practice

government decision that those resources should be provided. Supplementary finance was made available to regions for the initial development of such regional schemes.

In a comprehensive NHS such developments will not take place generally unless a central decision is reached. With the knowledge of the Standing Medical Advisory Committee a conference of those interested was called under the chairmanship of the late Lord Rosenheim. The conference agreed that we had reached the point where further development of regional centres was desirable, and advised that a small expert group should be set up to formulate detailed advice to the Health Departments. That group produced advice upon which the central, indeed political, decision had to be taken to make available the additional funds.

Another development involving very large cost did not require a decision of this kind. When L-dopa became available in quantity through ordinary pharmaceutical channels a decision could hardly have been made to preclude its use in Britain at all. So, at a cost of millions to the health service, the development became general with the central department taking action only to secure that early supplies were first made available through hospitals where the use of the drug could be best controlled. As mentioned earlier similar arrangements had been previously made when cortisone and streptomycin first became available, and later when anti-haemophilic preparations were provided. All these examples involved co-operation between the central department and the profession on clinical developments with considerable resource implications. That co-operation had become much more intimate by the time that the haemodialysis programme and the use of L-dopa were possible.

Similar developments will no doubt occur in the use of other new drugs, but some drugs are of such potency that they can only be used safely and effectively in the conditions of a hospital specialist unit. For instance the intensive use of cytotoxic drugs for the treatment of leukaemia or some other forms of malignant disease is only possible if they can be used in a proper sequence and with special precautions against infections such as can be found in a highly specialized unit. The MRC planned such a development using NHS resources. The drugs in themselves are not difficult to

Change in clinical practice

supply; but their coherent use requires resources and a team which are found at few places or an agreed multi-centre programme on similar lines.

Control may not be readily accepted. Facilities for the treatment of chorio-carcinoma could have been concentrated with advantage at one or two centres at a fairly early date, but were only so arranged after a considerable period during which clinicians eventually came to accept the advantages to their patients. A national scheme for laboratory surveillance of the results of and the need for treatment could have been devised and might have been introduced, had there been general acceptance, four or five years earlier than they actually were.

INTENSIFICATION OF HOSPITAL USE

Since 1948, hospitals have been used with increasing intensity. Turnover in use of beds has almost doubled, though the average number actually available has fallen by one-tenth even in the last decade, and the average patient stay in non-psychiatric beds by more than a quarter in the same period. It could be argued that this development has been dictated by shortages rather than by valid medical principles. Yet in comparison with North America the average stay in British hospitals is appreciably longer, even allowing for differences in the proportions of particular diagnoses.

Maternity services give the best example of the kind of change that has occurred. The length of stay after delivery was progressively shortened to meet the increased demand for delivery in hospital and the rising birth-rate between 1954 and 1964, and is still declining. Nevertheless, the average stay after delivery is still longer than in North America. There is reason to believe that women who already have three or four children are better prepared to accept delivery in hospital if they are allowed to return home after a relatively short time. The consensus of medical opinion in Britain today would appear to be that it is in the interests of the mother to be delivered in hospital, though not necessarily to stay after delivery even for the average of a week, which is usual here. The study of perinatal mortality¹ by the

1. Butler, N. and Bonham, D. G. *Perinatal Mortality* (Livingstone, 1963).

Change in clinical practice

National Birthday Trust directed by Butler and Bonham, led many paediatricians to the conclusion that delivery in hospital is desirable in the interests of the infant. Even a stay of twenty-four or forty-eight hours is a safeguard for the mother and baby against the unforeseen emergency or finding at the time of delivery. This does, of course, require satisfactory arrangements for after-care at home.

In other fields there has been less ready acceptance that short-stay is in the patient's interest. Yet we have had a waiting-list for admission to hospital of the order of half a million since the NHS began. Most of these patients are waiting for elective surgery; some wait many months for relatively simple forms of surgery like repair of hernia. Older patients requiring operation for cataract or women requiring perineal repair may have to wait far too long. In 1972 the mean waiting times for these two conditions were four to five months respectively. At that time, the median waiting time for herniorrhaphy was 7.5 weeks and for treatment of varicose veins 11.8 weeks, and in each group the mean waiting time was nearly twice as great. Many surgeons have come to accept that short-stay or even out-patient surgery, wherever this is practicable in combination with good home care, is no disadvantage to the individual patient and certainly a considerable advantage to the large group of those waiting for treatment.

Medical acceptance of this kind of change is by no means general. It has developed more widely within the last ten years, encouraged by discussion organized centrally with the approval of the Royal College mainly concerned. The opportunity is not limited to surgical work. In Manchester, for example, a five-day ward has been used for intensive planned investigation, each patient staying only two or three days. It is true that the obstacle to progress has often been lack of resources, either material or human, in particular hospital districts. Out-patient treatment or day-care is not a means of reducing hospital expenditure over-all; indeed it may increase it. It is a means of giving service to a larger number of people at a lower average expenditure and without the delays which otherwise are inevitable. However, neither the profession nor the NHS appears to have made the best use of this opportunity, yet hospital medicine can be a planned exercise for

Change in clinical practice

many patients if staff will only see it as part of modern medicine to make it so, and above all the resources are then provided.

The opposition to modest changes in format of hospital medical records in the interest of economy and exchangeability has been mentioned earlier. Much interest is now being shown in the Problem Orientated Medical Record system advocated by Weed: a medical not a departmental initiative. This involves much more radical change and a systematized method which may prove of major importance as a means of improving patient care and achieving greater efficiency in hospitals and general practice. If it does prove its worth and comes into general use, the argument for opting out of it would have to be strong indeed. One recoils naturally from enforced uniformity, but the pleasure of being the lone individualist who is out of step is a selfish luxury not a virtue in such a matter. In hospital everyone is concerned about wasting bed-days or staff time. The commodity most commonly wasted is the patient's time and his seems to be the one voice never heard in the argument. Sound use of POMR might save a very large number of patient days in a year. If the system can be successfully adapted to general practice we might even see the end of the sixty years of service of the present unsatisfactory record envelope.

LEVELLING UP STANDARDS

It is doubtful whether any health service has ever been able to do all that could be done for the population it has tried to serve. The great technical advances of the last twenty-five years have progressively extended the practicability gap because of their demands on money and manpower. A comprehensive health service for a whole population sets itself the target of making available a form of therapy or a diagnostic procedure to everyone who needs it. But the target of providing a service of equal technical quality for all is clearly beyond attainment. The variation in individual skills of members of the health professions alone would make the objective of absolute equality unattainable. No one would suggest for a moment that there should be a conscious effort to reduce the peaks of achievement to the average level: the object is always to

Change in clinical practice

raise the average as far toward those peaks as skill and resources allow.

The earliest major development in the health service was the deployment of specialist staff so that every hospital centre should have an adequate team. That was the most important exercise in levelling up the quality of medical care throughout the country achieved in the first few years. It was accompanied by developments in improving nurse training and the training of additional members of the other professions who work with medicine in the health service. All these factors helped to raise the quality of care which could be given within the hospitals. There remained individual variations in ability and skill, such as would occur in any field. But the new system did make it possible to ensure that staff would have had training and experience to a level which could not have been generally guaranteed before. The regional system supported this by developing special centres and reference services in clinical and investigative work. But there still remained a spread in personal abilities and variation in quality in the physical resources available in hospital buildings and equipment. These factors naturally meant that some units could produce better results than others. No one would expect anything else. Some of the early studies by Morris and his colleagues showed that there was a difference in mortality from various surgical procedures between patients treated in teaching hospitals and those treated in other hospitals. A strict comparison could not be made because there were differences in age and in clinical selection of patients. The results really confirmed that more carefully selected staff in larger numbers, working in better conditions, could obtain better clinical results. This is not a hypothesis one finds difficulty in accepting.

The conclusion from these studies, that greater emphasis should be placed on improving staffing and facilities in the areas where they were least satisfactory, is not very surprising. Nevertheless, there is value in showing that failure to provide the resources required for the best quality of care will result in less effective care and in disadvantage to patients. That may be a blinding glimpse of the obvious but it helps in the effort to secure improvement where it is most needed. Improvement is not simply a

Change in clinical practice

matter of quantity. More effective use of what is available can produce even better results.

When the confidential inquiry into maternal deaths began in 1952 the regional death-rates per 100,000 total births ranged from 53 to 81 in the English regions and Wales. The rate for the whole country was 72 and the spread around it therefore not very large. At the time of the sixth report (1968/70) the Wessex and Liverpool regions had the lowest rates by a substantial margin, and the variation around the mean of 21 for the country as a whole was such that the region with the worst figure had a rate four times that of the best. Wales which had had the worst rate compared to those for the English regions now has one rather less than the over-all average. We have in England and Wales one of the lower maternal death-rates in the world and that for Scotland is slightly lower still. The improvement that has occurred, which has not involved large expenditure on something new, is a classic example of the benefit that close attention to detail in ordinary services can bring. This is the best example in British medicine of what can be achieved by persistent review of results, but its scope is limited if deaths only are scrutinized. A more comprehensive review of clinical results should yield much greater benefit.

The reduction by some 85 per cent between 1947 and 1972 in the mortality associated with anaesthesia despite increased numbers and severity of operations was probably helped by the study of such deaths undertaken by the British Association of Anaesthetists.

The study¹ of post-neonatal deaths in three areas, coordinated by F. Riley suggested ways in which similar improvements could be brought about in infant mortality. Such a study requires the collaboration of paediatricians, GPs, and the nursing staff who work with them, and a great deal more effort than was put into the study of maternal deaths. Neonatal mortality in England and Wales is half as large again as that of Sweden and Norway and the effort to investigate the reasons for this has been too sporadic to produce the results that we need. Again there are large regional variations and there are, of course, social factors, such as the quality of housing, which are not affected by action in the health

1. *Confidential Enquiry into Postneonatal Deaths* (London: HMSO, 1970).

Change in clinical practice

services. A special effort made in France to improve the quality of neonatal care appears to have brought their rate down to a level slightly below ours in a period of only three years. It is even more striking that the infant death-rate in Finland should now be no more than two-thirds of that in Britain, and that this level should have been achieved from a position worse than that of Britain twenty years ago. Intensive local efforts in parts of Canada and the United States have produced even better results in reducing neonatal deaths.

Infant and maternal deaths must reflect a much larger morbidity from similar causes. The object is not merely to prevent deaths, but even more to reduce the amount of morbidity and the risk that morbidity in early life may lead to permanent damage affecting the child throughout life. Improved maternity services may well have reduced intranatal cerebral damage. The best of our own centres for providing neonatal care for babies at risk produce results as good as any in the world, but the generalization of such results in regions is not being achieved as rapidly as it should be. A *national* health service is not necessary in order to have special centres which can produce high-quality results. The high quality of service in Aberdeen is not the result of the NHS. Any country in which the highest quality of medicine can be achieved will show some places where such results are obtained. The burden upon the NHS is that of generalization from the example of the best and the result of having such a national service should be the more rapid development of improved services available to all.

REVIEW OF PERSONAL COMPETENCE

The review of personal competence and performance in any professional field is a difficult and commonly ignored problem. Calne (*The Lancet*, 2, 1308, 30 November 1974) has commented on the implicit, and unjustified, assumption that a consultant appointed in his thirties remains capable of doing high-quality work to retirement age. His solution of individual self-examination is unconvincing. The practice of re-certification at intervals of some five years is required in some countries such as Poland and is under consideration in several states of the USA. In Britain seniority

Change in clinical practice

payments for GPs are subject to a required level of attendance at postgraduate sessions, though not to wakefulness during those sessions. Even that requirement is omitted for consultants. Unless re-certification is automatic after attendance at courses a new problem of the once-qualified failures for re-certification will arise. The Merrison Committee may have recommendations on this, but subject to that the likeliest course seems to be the development of increasingly explicit requirements of postgraduate education, and of peer group review of the outcome of clinical work, something the profession must do for itself.

Machinery already exists for dealing with the ailing colleague, but it is seldom used. The profession is understandably reluctant to sit in judgement on colleagues but must realize that, if it does not, someone else will inevitably do so. Part of the problem is the stark nature of the alternatives: confirmation of continued fitness to work or compulsory retirement. An easier means of transfer to other work would be an advantage.

CHANGE IN PSYCHIATRIC CARE

There are some fields of medical work in which progress is slow, simply because the problem is so large. The improvement in mental health services of the last twenty years was the result of applying methods that had been developed at such centres as Warlingham Park, the acute psychiatric units established in general hospitals in the Manchester Region, and in the Worthing experiment. The improvement was helped by the development of new psychotropic drugs. Similar changes have occurred in other countries using the same methods. The pioneers in these developments were only slowly followed by others and there are still backwoodsmen who have not heard the message. It has taken twenty years to bring the main body of psychiatric opinion in this country behind the change from isolated large mental hospitals to a main effort in psychiatric units at general hospitals.

The Standing Mental Health Advisory Committee was considering the development of day-hospitals as far back as 1951 when I was asked to take the opportunity of a visit to Canada to report on the pioneer day-hospital developed by Professor Ewen

Change in clinical practice

Cameron in Montreal. The Committee was so impressed by his results that it urged similar changes here. A statistical analysis by Brooke and Tooth in 1960 showed that the emphasis on early treatment and shorter stay was already making it possible to serve the population with a relatively smaller number of beds. Ten years earlier any forward planning had been for yet more beds. The argument about that change has gone to and fro ever since while the change that was predicted in 1960 has been going steadily forward. It is now possible to envisage using a smaller number of beds than Brooke and Tooth forecast, provided there is adequate provision for geriatric care and out-patient, day-hospital, and community care facilities are developed.

This sequence of events spread over twenty years is an interesting example of the way in which change can be brought about in medicine by the interaction of many different influences, not all of them medical. There has been no dramatic cure or prophylaxis such as the antibiotics and vaccines have provided against communicable disease. New drugs have helped in that they have made patients more responsive and accessible to the staffs attempting to treat them. There are many more fully trained psychiatrists, and training in psychiatry, both for the specialty and for general professional training, has been greatly improved. Some hospital buildings have been improved, but most of the accommodation is still lamentably out of date and a real obstacle to improving patient care. Psychiatric nurse training has improved and has been linked more closely with general nurse training, and recruitment although inadequate is better than it was. But a change in public attitudes and acceptance of the practicability of keeping patients with mild manifestations of mental disturbance in the community may well have been at least as important as any professional contribution. The part which can be played by the social services has been recognized and although they are still insufficient they have been improved.

The professions and their organizations and bodies like MIND (the National Association for Mental Health) have helped to accelerate these changes. The Central Health Service Council machinery through the Standing Mental Health Advisory Committee and the Standing Nursing Committee has provided useful

Change in clinical practice

central guidance. There has probably been more interchange between the central departments and the professions in evolving a mental health programme than in most other aspects of the NHS.

One of the most interesting phases of this process of consultation led to two conferences on providing a comprehensive district psychiatric service for the adult mentally ill, sponsored jointly by the Royal College of Psychiatry and the DHSS in 1972 and 1973. Proceedings of the first of these conferences, which lasted for two days, were published by the Nuffield Provincial Hospitals Trust.¹ The second was published by the DHSS.² Another conference on mental handicap was organized by the Royal College of Psychiatry and departmental staff took part. The interest in these conferences arises from the broad measure of agreement that emerged, and the fact that such large-scale open consultation could take place.

These were not conferences held to receive dictates from the centre, but serious consultation in which doctors, nurses, social workers, and health service administrators all took part. An orderly sequence was not planned from the beginning, but developed with experience as we went along. To me, the most important part of that development is that the further we went the more open and consultative the process became. It is easy for the central authority to regard opposition to its plans as uninformed and obstructive and for the profession to regard the DHSS as bureaucratic, uninformed, and parsimonious. A 'we' and 'they' attitude of that kind is far less likely to produce the best result than the more flexible approach in which any reasonable comment has a good chance of being heard and having effect.

The improvement in the care of the mentally ill and handicapped is an example of changing practices as well as providing resources. The reports of the Hospital Advisory Service give ample evidence that neither process has gone far enough. But the achievement in the face of shortages has been much greater than any of us anticipated twenty years ago. That such gross defects remain is mainly a reflection of the insufficient resources available to the health service and the extent to which the problem has

1. Cawley, R., and McLachlan, G. (eds), *Policy for Action* (Oxford University Press for the Nuffield Provincial Hospitals Trust, 1973).

2. *Providing a Comprehensive District Psychiatric Service for the Adult Mentally Ill*, Reports on Health and Social Subjects 8 (London: HMSO, 1974).

Change in clinical practice

increased through a larger number of older people in the population and the longer survival of patients in long-stay care. Had there not been very great improvements, and if the custodial attitude of twenty-five years ago still obtained, our problem now would be infinitely worse.

CHANGE IN GERIATRIC CARE

Somewhat similar problems have occurred in the care of the elderly chronic sick. The number of people aged over 65 in Britain is now some two million greater than it was in 1950. There has been no comparable increase in the number of hospital beds available for their care. There are now more old people with chronic illness living at home than at any time in our history. This is not in itself bad; indeed, provided they can be given sufficient support at home, it is the desired result. It reflects the change from the custodial attitude which was formerly present in our care of the chronic sick. More are actively treated, more are rehabilitated to the point where they can be sent home; but the increasing number of the very old means that there are also more who are beyond the point at which they can be rehabilitated. That makes the burden heavier still. Furthermore, the very success of early treatment of so many patients increases the load, because those who are discharged from hospital required less care than those who remain.

Unhappily public attention is mainly given to the occasions when, under these increasing stresses, things go wrong. In geriatrics, no less than in other clinical fields, demonstration of results that can be achieved by some of the best units could be used to help improve the performance of all. A conference¹ organized jointly by the DHSS and the British Geriatric Society concluded in 1973 that this is not a matter of providing new and unusual methods of treatment or diagnosis. It is a problem of applying familiar procedures more effectively, perhaps with better organization, and of putting what effort we can afford into improving the quality of the accommodation and the nursing and other equipment associated with it. A great change has come over the

1. Proceedings available from the DHSS.

Change in clinical practice

medical care of the elderly chronic sick, but it needs to be more generally and more intensively applied by a larger number of fully trained people.

NEW BURDENS OF ILL-HEALTH

As medical science advances it may produce new methods, such as those that became available in the first ten years of the NHS, which would make treatment more effective and shorter in time. That is probably more likely in psychiatry and oncology than elsewhere, but there is no clear sign of it yet. Most recent developments have tended rather to provide additional opportunities for the treatment of conditions which cannot be completely cured but may be arrested or retarded by therapy of a maintenance kind. That may prolong life, generally of a quality that makes such preservation unquestionably desirable. The problem is that maintenance therapy almost certainly involves expenditure over a longer term than the methods it supplants. Prevention of such chronic conditions, which may have been possible earlier in the patient's life, may no longer be so once the condition has become established. The secondary prevention or limitation of disability then becomes the aim of health care organization. Choices must be made and they are neither purely medical nor social nor political. On the professional side they will increasingly involve multidisciplinary contributions and for the public as represented by those they elect, decisions of a nature they have not previously had to face. While care can be vastly improved this must not be at the expense of cure in the sense of action which may prevent or postpone major crippling disability.

The object of health care cannot be merely the postponement of death, but rather the preservation of health and abilities during life. It is significant that male life expectancy at birth is two years less in Britain than in Sweden and even more, that of all insured men in Britain aged 64 one in eight has been certified as unfit for work for a year or more. That reflects the burden of ill-health we should be chiefly concerned to reduce.

II

Prospect

In this monograph I have been concerned with the evolutionary process as it develops within the profession of medicine and the provision of health care. Medicine would, of course, change and advance without a National Health Service. But, after twenty-seven years of such a Service, the different strands of medicine have become so interwoven with each other, with the other health professions and the administration, even with Government, that they could only be dissociated again in a state of general social breakdown. It cannot be a serious intention of any of the participants in the recent disagreements that such anarchy could be allowed to occur.

Specialist practice in Britain has more than doubled only because the NHS made that possible and no one can imagine it to be professionally or financially viable at the present level without the integrated supporting services of a region. General practice has been established on a basis of equality with hospital specialties and given a greatly increased level of capital investment to match its resurgence of confidence and professional interest, only because the NHS deliberately gave it selective support. The intake to our medical schools has doubled in fifteen years only because Government has funded this costly growth. Postgraduate education based on all hospital centres and the related universities has developed better than in most other countries because Government has been prepared to go more than half-way to meet the enthusiasm and voluntary effort of which the profession is rightly proud.

That is only one side of the picture. The system may be benevolent in intention, if sometimes inflexible in execution, and may continue to be so. It may have evolved into what looks like the ideal system for developing health care for the whole community: the district complex of district general hospital group and practices in the community, both served by a postgraduate centre. But the medical profession sometimes sees itself as locked in a system which

Prospect

gives it too little freedom. At the same time, it is frustrated by insufficiency of resources, human, monetary, and physical, for efficient performance of its functions. Remuneration is also a source of discontent for senior as well as for junior doctors. Although other, lower-paid, workers in the NHS have often fared a great deal worse, that is not comforting to doctors themselves. Talk of resignation and actual sanctions, however, may be aimed at Government but they hurt only the public and the reputation of the profession with them. Such threats would probably not have been heard if it had been possible to put into the NHS more of the resources it needs.

The NHS is not at the point of collapse in February 1975, but it is more gravely embarrassed than it has ever been and its advance has received a severe check. That embarrassment stems from having too little and attempting too much. The best compromise in matching resources to tasks has not been found. In retrospect, the first decade of the NHS contained 'the years that the locust hath eaten'. The country did not have capital to provide the hospital improvements needed, though it did provide some of the new staff that were required. The organization of the new staff became fixed in a pattern, derived by the Spens Committee from the teaching hospitals of the 1930s. Both the profession and the health departments shared in the grave miscalculation of the Willink Committee on the number of doctors needed. Yet the outcome is a position from which, given sufficient resources and the best use made of them, this country can have as good health care as any and better than most.

For that, the first requisite is the end of strife: not only between the profession and Government but also amongst those working in the NHS. One point is transparently clear: there is no victory to be gained by anyone. The health departments need the BMA just as much as the BMA needs the health departments. The empty slogan about taking medicine out of politics denotes real lack of understanding. The expenditure of one-eighth of the national budget on a service which is used by two-thirds of the population in every year cannot be out of politics. We need to consider the major components in the future of organized health care in turn. It is out of the question that we should go back to the unorganized

Prospect

and inadequate care of long ago. The world-wide trend is to greater not to less government involvement.

THE SERVICE AS AN ENTITY

Relationships within the NHS are inevitably complicated and each participant has his or her own highly individual view of them. This depends partly on how the individual sees the Service. My own concept of it has always been as the composite of services to patients of which I have already written. That is mainly a district affair and its success and acceptability depends most of all on the humanity and efficiency of those in direct contact with patients. But those individuals need supporting services not less devoted and they need material and economic support at appropriate levels. When these needs are reasonably satisfied or perhaps there is the foreseeable prospect of the new health centre or district hospital the district group has a family feeling that embraces the medical profession with the rest. In any family the interpersonal relationships change with time and the senior members are often the slowest to see, much less to accept, the change. The counterpart to that can be seen in the medical/non-medical conflict through which we are passing: it has to be resolved like conflict in any family by give and take.

The districts form a regional family which is necessary for many reasons directly relevant to services to patients. The professional, educational, and scientific links are readily comprehensible and some of the old hospital regions had a very real identity of purpose which should be inherited by the new regions. The reason for areas is different. The need which brought them into existence is that of associating health with other social services, including education, and with the directly elected membership of those authorities. The existence of central health departments could not be avoided even in a country like Sweden where so much of the funds come from local taxation. They do fill a real need and the ministerial personification of the NHS can be of the greatest importance.

Nevertheless the doctors, nurses, and others working direct with patients are the service, however much departments, regions,

Prospect

areas, and district teams may guide and support them. Success will depend on the extent to which administrations at all levels succeed in identifying with the people at the interface with patients, and avoid temptation to see themselves as the key people. Most of the change in the service to patients occurs from the simple continuous process of change at the district level. Even Acts of Parliament have only been consolidating and enabling measures at crucial periods of growth. They have changed the finance and administration which enabled services to go on and develop. In such a situation personal relationships at all levels become just as important as competence. The late Professor Ian Aird once said to me twenty years ago that 'great man-manship' in surgery was ended. That comment has implications for much that has happened in the NHS since; it implies that teamwork has become more important than the work of the individual even at the clinical level. No team works without understanding amongst its members. It is that understanding in the service as a whole that must now be patiently rebuilt.

Mr Enoch Powell¹ once said that the most surprising aspect of the NHS to him was the 'deafening chorus of complaints' which arose on every side from those involved in it. People seem to have forgotten the desperate shortages which characterized the old system and the near bankruptcy from which the NHS rescued the voluntary hospitals. Now, too often, shortage is the fault of someone else or of the system according to any participant affected. A Minister coming to the leadership of such a service faces a stupendous public relations exercise just at the moment when he must try to reach the necessary understanding of the technical range of the subject and of the competing interests of the hundreds of people who will immediately rush to him with advice about courses which will rescue the service. There are no such panaceas: even some of the money so desperately needed can be an actual disadvantage if used only to bolster some outworn practice. Perhaps the originator of the service, Aneurin Bevan, with his drive and conviction coupled with a sensitivity to the occasion when it was better to concede a small point of dogma than to

1. Powell, J. Enoch, *A New-Look at Medicine and Politics* (Pitman Medical, 1966).

provoke complete rejection was the greatest stroke of fortune the NHS has had. There have been others and there will be more.

RESOURCES

It is possible to look at expenditure on the NHS in various ways. The vast bulk is financed from central taxation; one-thirteenth comes from National Insurance contributions—in effect a selective tax; and only a small fraction comes from patients' payments. The Office of Health Economics has given the following estimates of charges which would each have yielded £50 million in 1974: an increase of 1p on the standard rate of income tax; or the price of a gallon of petrol or on the price of a packet of twenty cigarettes; an increase of 4p on the weekly National Insurance stamp; a charge of 40p for each GP attendance, allowing for half being exempt; an increase of 35p on the prescription charge, with half exempt; a £6 per week 'hotel' charge in hospital, excluding mental illness, with half exempt. Additional funds can only be obtained from further payments by users or provided by the Exchequer: from increased taxes or charges such as these or by redistributing public expenditure to the disadvantage of other public services. These are the choices that would confront the Government and the public if the proportion of the national income devoted to health care were to be raised to a level nearer that of other developed countries. Those of us whose primary interest is in health services might view such changes with equanimity. Others might become actively hostile as can be seen in some countries where health has a larger share.

It would be costly simply to raise per capita expenditure to the best level obtaining within the United Kingdom. In the financial year 1971/2 the expenditure per head on the NHS in England was £41.87; in Wales it was £43.66 or 4 per cent more; in Scotland it was £50.44 or 20 per cent more. The cost of bringing expenditure in England and Wales to the Scottish level in the year quoted would have been more than £400 million. That would have needed, perhaps, 32p more on the National Insurance stamp or 8p on the standard rate of income tax. The real needs of the countries

of the UK do not, of course, justify exactly equal rates of expenditure. Factors of distance, for example, raise some costs in Scotland while other factors raise costs in parts of England, and there has certainly been a great need for hospital capital expenditure in Wales. But the disparities are too great and there is indisputable evidence that some English regions now have greater unmet need for resources than any other parts of Britain. They have the strongest claims on any new provision Government may make in future.

THE SELECTION OF PRIORITIES

The underlying assumption of the NHS is explicitly that the GPs in a district accept responsibility for the primary medical care of the whole population and implicitly that the hospital staff will between them provide all the specialist supporting medical service within their capacity. The NHS has relied on that assumption in a way that has become extremely onerous and has led to revolts first of junior and then of senior medical staff. The professional obligation to deal with emergencies is only one part of the total specialist obligation, and delay in performing elective work is frustrating for staff as well as incommoding or even causing injurious effects to patients. The remedies are partly more generous provision of resources and partly more efficient use of what is provided. Often greater efficiency depends on more and better help from non-medical staff and that too requires extra resources.

The new organization should be well adapted to making the right local choices, but its first problem has been to make do with insufficiency rather than to choose for possible expansion. Change and advance continues and should lead to reorganization and re-deployment. The burden of the Presidents' and Deans' memorandum to Ministers in October 1974 was that lack of funds was steadily increasing the gap between the potential of modern medicine and the actual achievement in the NHS. In the face of this ever-widening gap, inaction would be demonstrable in terms of lost advantage for the community and frustration for the professions and those they serve. There have been many instances of gains resulting from better use of existing resources. The steady

Prospect

increase in proportion of hospital deliveries has been achieved mainly as a result of shortened post-partum stay in hospital. The great increases in all annual admissions has been the result of shortened stay, not provision of more beds. Such changes can be carried further, but it would be fanciful to imagine that some management magic can compensate for the whole or even most of the shortfall in resources.

It is frequently suggested that a large proportion of patients in hospital do not need to be there. This is not so much a reflection of needless admission as of too long stay. Health care planning teams looking at acute services should be able to suggest improvements in the use of existing hospital facilities which will give better service to more patients. The first priority must be greater efficiency and less waste in providing the services most often needed. Savings so produced can then be used for new developments. No specialist, or general practice group is entitled to disregard the possibility of making such savings. All too often reorganization requires some pump priming with additional resources which cannot be found within present budgets.

THE EMERGING DISTRICT COMPLEX

The great advantage we have now is in the district complex of the district general hospital/practice groups/postgraduate centre which was already beginning to function before 1974 gave it a formal existence. The complex is admirably adapted for the development of community and hospital services in a form for which the so-called 'Best-Buy Hospital' was designed. That particular development was a plan for a service not just for a hospital building. We must not disregard the support of medical scientific progress, but fully effective use of the district complex for ordinary services is more important.

One hears constantly a demand for greater concentration on primary care and prevention, with very little attempt to define what this means. Health centre construction is a priority but better health centre use is more important still. All too often, greater use of the community hospital is postulated, without appreciation that its essential function is in long stay and the

simpler forms of care; for most other purposes it would be a costly unit and less efficient than the district general hospital. There is general agreement that the community hospital is not for specialist work; no good purpose will be served, therefore, if it performs less expertly some of the minor special functions. The BMA report on the Primary Care Team¹ opens an otherwise useful contribution with a regrettable attempt to put the clock back by calling for small maternity units in community hospitals. There is ample evidence that this is contrary to the interest of either a mother or a child with an unpredicted abnormality. Moreover, small maternity units are expensive and difficult to staff.

Much of the confusion arises from failure to envisage the working of the district as a whole in which specialized hospital-based service and community-based general service are complementary without sharply defined boundaries between them. Neither can function with full efficiency alone. The greatest inefficiency occurs when one tries to subsume the role of the other: the in-patient or out-patient held too long by the hospital and not referred back to the GP; or the patient referred to the specialist sometimes after undue delay and elaborate, but incompletely relevant, investigation. If medicine is to be specialized, as it must be for effectiveness, then one specialty should not do the work of another. Above all, the different groups must communicate and do so at the right time. The postgraduate centre must be used to ensure spread of new knowledge, especially on the use of drug and diagnostic methods.

REGIONAL PLANNING

Regional planning, educational, and research work is necessary in support of the districts. It has become fashionable to denigrate the work of regional hospital boards, often on doctrinaire objections to their constitution. They varied in their capability, but to them should be attributed the development of specialist staff and the orderly evolution of the hospital capital programme, once the funds were provided. The personal mark left by some of the best SAMOs on the services of particular regions is still to be seen. A

1. *Primary Health Care Teams* (BMA Board of Science and Education, 1974).

Prospect

regional contribution is essential for the future, the more so as planning and selection of priorities must be developed on a regional basis to deal with further scientific advance. Other countries have found the same need, even with less organized services than the NHS. There is an essential regional function as there is the basic district function and neither can be as effectively discharged at area level.

Among changes that must be brought about by better regional planning are improvements in training and distribution of medical manpower. Training plans should be regionally devised applications of the training programmes recommended by the Royal Colleges and specialty associations. Such regional planning requires a partnership between the regional health authority and the university. This, indeed, is substantially in being, and has evolved further during the great development of postgraduate education in the last decade. A partnership in which the RHA provides the resources for training and the university most of the planning and guidance may seem unequal, but has developed steadily and effectively. Guidance from the centre, not only from the specialty associations and the Royal Colleges but also from the Council for Postgraduate Medical Education, has been supplemented by assistance in developing national facilities such as those arranged for advanced specialty training in some of the less usual fields.

In the field of manpower development, the general disproportion between numbers of doctors in training and numbers established in consultant posts has been slightly reduced in recent years, but still requires continuing action over a considerable period. This has to be related, too, to greatly improved patterns of career guidance. Informed career guidance requires background information provided from the regional and national level. In a developing health service there will be continuous change. Delayed application of new developments of medical science often results more from failure to plan the use and distribution of resources than from slow spread of information. There are well-established channels for the dissemination of medical scientific knowledge, but discerning application of that knowledge in the planned use of resources is a matter requiring regional action even more than action at the district level.

PROFESSIONAL DEVELOPMENTS

The medical profession has always been concerned about its representation in management and decision-making. It may sometimes have been too much concerned about the representation of particular professional interests by making that representation wholly elective rather than by other means of securing the required spread of expertise. The new system has been adjusted in order to take account of that requirement and it certainly should be a great advance upon the advisory committee constitutions under some regional boards to which the profession took such exception in the early years of the NHS. At that time, the regional hospital boards might choose quite arbitrarily the medical people from whom they would seek advice, and it was only by a prolonged effort of persuasion that all the boards were brought to agree to a representative element in their medical advisory machinery. The resistance by some boards to that change is interesting because it reflects one of the continuing difficulties in the NHS. No single body speaks for the whole profession, even though the BMA is accepted by the majority of the profession as representing them in negotiations related to their more material interests. There are much easier relationships now than existed twenty years ago, but upon the development of greater trust in those relationships in the future much of the success of the NHS will depend.

Two years ago a group of leaders of the medical profession wrote to the medical journals suggesting that there was a need for a British Academy of Medicine which would play no part in the field which properly belongs to the BMA, but would act as a co-ordinator of professional views and would often formulate them for the benefit both of the composite parts of the profession itself and of the health departments. Such an arrangement exists in Sweden where the Swedish Medical Society and the Swedish Medical Association each have their own spheres of action in relation to the central health department. Whether such a development will commend itself to the profession remains to be seen, but I for one have no doubt that the profession has much to gain from an understood degree of separation between responsibility for its

Prospect

material interests and responsibility for those things which matter most to the art and science of medicine. It is beyond doubt that the recent move toward closer collaboration of colleges, faculties, and specialty associations should be accelerated and I am one of those who believe it must soon lead at least to a federated structure.

This is not the place to discuss remuneration; it is sufficient to point out that crises between the health departments and the profession have always been related to this matter, even if only indirectly on the private practice issue. A Service in which remuneration is by inflexible national scales will always be liable to crises of this kind if those scales are not adjusted so as to prevent doctors lagging behind members of other professions. The alternative of fee-per-service payments, with or without a contribution from patients, has its own complications and has always been found expensive elsewhere—too expensive most administrations would say—and liable to distort patterns of service. One need only recall the way in which a switch to conservative dentistry was deliberately induced by a relative reduction of fees for provision of dentures over twenty years ago to appreciate how comparable change could happen for less attractive reasons in medicine. The conclusion seems irresistible that it would be an impediment to sound service development, an obstacle to economy, a great addition to the administrative burden, and a source of possible distortion of the service if a fee-per-service system was introduced. Such systems elsewhere seem to have been serious obstacles to the development of health care teams, for instance nurses and doctors in North America.

Twenty years ago the recent militant action would have been unthinkable. That it was contemplated in 1957 before the Royal Commission on remuneration, actually used by one section of the profession ten years later, and then by the consultants in 1974/5, reflects a decline in relationships that should not have occurred. If the Review Body had fulfilled the doctors' hopes of keeping their relativities with other large earners unchanged it might not have happened, though relativities within the profession would have had to change. The aftermath of this dispute will last a long time, and some doctors, of whom I am one, believe that far more has been lost in public goodwill and professional repute than can

be compensated by any financial gain, if indeed there is any such gain. True, there is no gain to the health departments either, but that only emphasizes the point that the public is the loser. But, however one may deplore the deliberate curtailment of work in early 1975, described as working to contract, one has to appreciate that the frustration from which it resulted had not been unprovoked. The majority of hospital medical staff have worked longer hours than any contracts have or could have implied, because of a traditional sense of professional obligation. It will be a most damaging blow to medicine, as much as to the NHS, if either GPs or specialists see themselves as no longer under obligation to the whole community.

TECHNICAL PROGRESS

It would be folly to attempt to forecast medical advances. The profession has changed greatly since the end of the Second World War and the science already available to it is not fully used. The major theme of this monograph has been that, if the recent and prospective advances can be applied more effectively, much general improvement is possible.

Technical progress in surgery is certain to lead to more critical assessment of the justification for some of it. There will be new developments in drugs and immunotherapy and increased understanding of the action of drugs. These will emphasize further the importance of clinical pharmacology as a specialty with a distinctive importance in continuing medical education. Among these developments will be continuation of the advance of non-surgical treatment in malignant disease, possibly associated with radical changes in the use of ionizing radiation. These advances will make the importance of the district service linked into a regional scheme even greater. An integrated programme for the management of treatable cancer should emerge from the present experimental oncological centres. The costs can be so large that discriminating use of the new resources will be essential.

Prevention should be given more prominence than it now has, but the opportunity is chiefly educational, by selective use of screening and by greater attention to rehabilitation and

Prospect

environmental factors. The methods of pregnancy control must be expected to improve and, hopefully, the incidence of unwanted births to decline. Prenatal diagnosis of congenital abnormalities as discussed in Harry Harris's monograph¹ last year is likely to develop. Child health services are unified under the new administration and paediatricians in many centres have been turning to closer collaboration with community and preventive services for some time past. There is still advantage to be gained from more complete use of immunization, especially against measles. There may be gains from new anti-viral drugs in childhood respiratory infections. There is still prospect of identifying damaging factors in the environment and modifying them, but there are not other large, new, and promising opportunities for widespread specific prophylaxis. The best prospect remains that of prevention by deliberate change in habitual behaviour patterns. The measures which would do most to improve health and increase life expectancy are the cessation of cigarette smoking, reduction in the consumption of alcohol, less fast driving of motor-cars especially with drink taken, less over-eating, and continuation of physical exercise throughout life.

We should be able to secure a modest increase in life expectancy to bring the prospect for men closer to that for women. Britain lags behind the Scandinavian countries, the Netherlands, and Switzerland to an unacceptable degree. If we could reduce mortality before the age of 5 and smoking-related deaths after the age of 45 our vital statistics would be as good as those of Sweden, Norway, Iceland, and the Netherlands: they are already better than in Sweden at the ages of 15 to 35. More important, we should be able to reduce invalidity during working life, especially by better rehabilitation. We must improve the quality of the care we provide for long-term illness without sacrificing the more sophisticated treatment which can prevent long-term invalidity from becoming established.

The lesson to be learnt from an examination of the way in which any improvement in the health of our population has been brought about over a century must be that ordinary methods of

1. Harris, H., *Prenatal Diagnosis and Selective Abortion*, Rock Carling Monograph (London: Nuffield Provincial Hospitals Trust, 1974).

Prospect

dealing with common conditions used with the greatest efficiency available at the time, will affect the largest number of people. The scientific spur of the new and the highly expert not only helps the relatively few patients to whom it immediately applies, but also contributes to raising the quality of the work done for patients with many of the more commonly occurring conditions. We need, therefore, to secure the marriage of the two.

When we are ill, we all hope that we will receive the highest scientific level of diagnosis and treatment that our condition requires, provided for us in the most humanly acceptable way that is possible in the circumstances. We want human contact and reassurance from people known to us if possible and, known or not, from people who are understanding. That can be assured for us by a level of professional integrity that includes not only scientific expertise but also attitudes induced by training given to people of the right kind of personality in the first instance.

THE PUBLIC AND THE PROFESSION

Over the years various inquiries have reported that the medical profession stands higher than most others, except nursing, in public esteem. But this country has passed through a social revolution in which the relativities of different social groups have changed radically. That is reflected, in my experience, in very different social attitudes amongst students and young medical graduates now compared with forty years ago. Society in Britain is far more egalitarian and the medical profession is, or should be, undergoing similar change. The spread of expendable incomes of the great majority is much less wide.

Tudor Hart has recently argued that medical students are still predominantly drawn from social groups unlikely to be fully sensitive to these changes. Without fully accepting that view, I do believe he makes a good case for selecting some mature students who come from the other health professions and for paying more regard to factors which are not purely academic. When the teaching hospitals where students were trained were charitable bodies, with unpaid senior staff, there was an undeniable flavour of condescension toward patients. My own contacts with students

Prospect

and young doctors have impressed on me their awareness and rejection of any survival of this. Yet it remains true that some doctors still show signs of believing that they confer a favour on society by devotion to its service. The truth is that most doctors, in following their vocation, derive the special satisfaction from this particular kind of service for which they hoped as students. It is something for which they are rightly grateful.

The relationship with the public is crucial. Here I am more concerned with public understanding and approval of the choices made about the nature of care to be given. The criticism that the pursuit of better management has dangerously reduced public participation in the new administration will be justified if the new democratic element, the Community Health Council, is not made to work. If there must be less service in a district or service must be less convenient for the patient, so that other more urgent or effective things can be done, the public must be enabled to understand the reasons.

We know from many surveys that the public broadly approves of the NHS but we also know that many individual complaints are made. Rudolf Klein's book *Complaints Against Doctors* (1973) and other evidence considered by the Working Party on General Practice suggest that the basis of complaint is more often social or concerning organization than technical. The same was true of complaints in the hospital service studied by the Davies Committee. The most commonly reiterated complaints are of delays or inconveniences in using the service or of lack of communication. Unfortunately, the process of adjusting medical work hours to a pattern not too dissimilar to other people's has not been easy. So far as communicating with patients is concerned, medicine is no longer a mystery and people know that it is explicable and intelligible in human terms. Some may have faith in their advisers and be content not to know, but others will want to understand all they can and the professions will be increasingly vulnerable if this opportunity is withheld. The problems are not peculiar to this country and are undoubtedly far more acute in many others.

The public now knows much more about medicine, though often that knowledge is distorted and expectations are too high. The presentation to the public of medical information must be

Prospect

improved. Despite the serious efforts of 'medical correspondents' in the press and broadcasting, the new value of a dramatic occurrence like a recent series of deaths from influenza in an old people's home obscures important, if less 'newsworthy', advances that have been made. Public expectation is often greater than the capacity of medical science. Lack of understanding can lead to needless clamour for formal inquiry. We need to develop a steadier flow of accurate information in a lower key as is well done in the USSR. The health care team in the community could become the best instrument for this.

A FINAL ASSESSMENT

Changes in medicine under the NHS have been far-reaching and mainly beneficial. They have given us a universal service which has guaranteed a level of health care which has fewer gaps than have most others. We have not made the best use of what we have; and we need more resources, better managed. The present differences within the profession of medicine and between it and the other health professions have seriously embarrassed the NHS, as have the differences between the professions and government. None of these difficulties is insurmountable, given tolerance and goodwill from all the factions. The lack of that tolerance has led to events in the health service which are a credit to no one and a cause of sadness to many associated with it. Without hesitation I acknowledge my own contribution to the failures.

The NHS is the sum of countless services rendered daily to the people by the members of the professions and those who work with and for them. The part of government and the administration is enabling. The chief need at this time is a restoration of confidence between the two, and to that restoration both must contribute. I believe that it will be done and that the medical profession will play its full part in the process.

Epilogue

Lord Platt concluded his monograph with an Epilogue which he wrote very much as a physician. Throughout he had revealed the wisdom of one in the forefront of clinical medicine. In his epilogue he wrote: 'Doctors differ among themselves. Physicians are different from surgeons.' I doubt whether I can now subscribe to that implied special endorsement of physicians in the sense in which we use the term in Britain.

I have been a chairborne observer of practising doctors for all but the first five years of a career now ended. I have seen the difference of which Lord Platt wrote fade. Of course, doctors have different aptitudes and skills, but none now rests simply upon those. Isolated individual responsibility in medicine no longer fulfils the function of our profession in the community, even though the one to one relationship with a patient in the clinical situation remains the most important of all. We are one profession, more completely interdependent than we have ever been in the past. We are part of a 'greater medical profession' which includes many others than the medically qualified. Beyond that we must also see the Health Service as part of a wider pattern of social services upon which our society depends in many ways which affect its health, happiness, and prosperity. It is in that context that we must seek the resources we need—not thinking of technical medicine and our one profession alone.

This monograph is written throughout with reference to British medicine and our present services. Some of it may have relevance to other countries with comparable services, but very little to the situation of two-thirds of the world's population. The needs of that majority far surpass our own. So long as the disparity between our health situations remains as great as it now is there can be no real satisfaction for them or indeed for us. British medicine has contributed much to countries of the third world, but much more will be expected of it in future. This is the major

Epilogue

health problem in the world today but the remedies for it are very different from those I have discussed. For that reason, and because I am not well enough informed to do it justice, I have deliberately omitted a subject which would have required a volume twice this size.

NOTE ON MAIN SOURCES

This book does not contain a detailed list of references because it would be so large as to defeat its purpose and would still be incomplete. The main sources of information, apart from thirty years of close personal contact with events, are published reports from both governmental and professional sources. The Dawson Report of 1920, the first White Paper on a National Health Service which followed the Beveridge Report, the Hospital Surveys of 1942-5, the Guillebaud Report, the Porritt Report, the Green Papers, and the Consultative Document which led up to the amending Act of 1973 are only the most obvious sources. The series of annual reports of the Ministry of Health and later the Department of Health and Social Security, the series of reports by the General Register Office (now the Office of Population Censuses and Surveys) and Health and Personal Social Services Statistics for England contain a mass of material which is more useful for the observation of trends than for individual quotation. It is one of the disadvantages in use of figures that they are too often the subject of comment or deduction that takes no account of trends. In particular the reports on the *Hospital In-Patient Enquiry* contain invaluable information which has been almost wholly ignored in this country.

The Annual Reports of the Central Health Services Council are chiefly of interest for the reports on the work of the standing advisory committees which they contain. The special reports of committees under the aegis of the Council and its standing committees have been most valuable and some of them have had a profound effect on practice: for instance that on the welfare of sick children in hospital. The series of short pamphlets for GPs on social and preventive aspects of medicine produced by the Standing Medical Advisory Committee has been a useful influence.

A series of reports of joint working parties beginning with the Platt Working Party on Hospital Medical Staff and continuing

Note on main sources

with the three Cogwheel reports and the report on general practice have been mentioned fully.

Other special reports on medical and allied subjects have appeared in the DHSS's Grey Book series, notably the six three-year reports of the confidential inquiry into maternal deaths and the pilot study on post-neonatal deaths. This series contains other reports of considerable importance, particularly on nutrition.

The Royal Colleges, specialty associations, and the BMA have produced many reports some individually and some like the Porritt Report in combination. The Royal College of Physicians' two reports on smoking and health were even more important to the serious move against cigarette smoking than the succession of reports from the US Surgeon General. The Royal College of General Practitioners' reports on many aspects of practice and especially the three reports on *Present State and Future Needs* have been most important to the resurgence of general practice, though the group of reports by Collings, Hadfield, and Taylor were earlier contributions to the realization of the need for reform. The series of reports on specialty trainings in medicine and surgery and the consolidated reports by the Royal Colleges reflected the growing activity of the colleges in postgraduate education. Indeed the change in the senior Royal College during and since the Presidency of Lord Platt into an active educational body has been a remarkable feature of the last fifteen years. Among the BMA's reports that on primary care was a valuable reinforcement of the work of the Royal College of General Practitioners.

The Willink Report stands out as an unhappy interpretation of the course of events made in good faith at a time when the demographic situation was about to change in an unpredictable way and the effects of changing medical science were to increase the need for doctors rapidly. The Royal Commission on Medical Education with hindsight gives a more correct view, but also demonstrates the difficulty of forecasting manpower needs.

On the problems of remuneration and conditions of service there have been many reports from the original Spens Committees' reports to that of the adjudication by Mr Justice Danckwerts and the thorough analysis by the Royal Commission chaired by Lord Pilkington. Subsequently reports of the Review Body on

Note on main sources

medical and dental remuneration contain more than mere recommendations about pay.

The Office of Health Economics has provided a constant succession of Information Sheets and pamphlets, many of which contain valuable economic analyses.

The Nuffield Provincial Hospitals Trust has a remarkable record of publications of value in promoting progress in the NHS. The monographs in this series have been important in this way, but the series on *Problems and Progress in Medical Care* has covered a far wider field and with the specific object the title indicates.

The main difficulties in the NHS are currently economic in origin and the details have been culled mainly from the series of official reports already mentioned, but much of the comparative material has been assembled in Abel Smith's WHO monograph. Maxwell's Survey Report *Health Care; The Growing Dilemma* brings the international comparison up to date. Hetzel's *Health and Australian Society* is an informed commentary on the Australian scene which has close affinities to our own. The Oxford International Symposium of September 1974 and the Institut Henry-Dunant symposium on *The Health Care Cost Explosion* in October 1974 both provided additional information shortly to be published.

This is a scanty acknowledgement of a few of the main sources of information. A full bibliography would require another volume.