The marvel of the lung and human responsibility—'A great contempt of God's good gifts'?

The Harveian Oration of 1994

The Harveian Oration is given annually at the College under an indenture of William Harvey in 1656. The 1994 Oration was given on 18 October by Professor Dame Margaret Turner-Warwick, President of the Royal College of Physicians 1989–92.

The cultural evolution of our species has depended upon the lung. The brain may be central for thought but without the lungs thoughts could not be expressed, and 'expression maketh man'. Without the lungs to give vent to feelings there would be no joy through laughter, nor sadness through weeping. The traditions of history would not have been handed down through lyrics and song; there would be no poetry, no drama nor vocal music. The debates of philosophers and theologians and scientific discourse—so important in William Harvey's life—could not have occurred. The equity of the Law could not have evolved in its present form without pleading—and think of a world in which politicians were speechless! The lungs as the organ of expression and communication have indeed much to do with human evolution.

But to return to science. The basic design specification for the structural and functional adaptability of the lung is, of course, to extract large volumes of oxygen from the air and facilitate its incorporation into a transportable form in adequate quantities to supply every living cell in the body. The gaseous products of combustion must be exhaled and returned expeditiously to the environment. The whole process must be fine-tuneable over a wide range of demand to give economy of effort at rest but with sufficient capacity for a twenty-fold increase in oxygen uptake required to operate the 'escape' mechanism for muscle cells to enable the animal to survive—through the simple expedient of leaving the scene of danger as rapidly as possible.

The adult lung has a total alveolar surface area of some 70 square metres (approximately the size of a tennis court) which has to be compacted into the relatively small six litre capacity of the thorax and be structured in such a way that it allows rapid access to atmospheric oxygen. From rest to exercise the volume of air shifted increases from eight to around 120 litres a minute. To allow for such a variation, lung elasticity is crucial and constitutes a great feat of tissue fibre engineering. The pulmonary circulation, must, of course, also be auto-regulated to match this amazing mechanical range in order to cope with the increased demands on exercise without shunting unoxgenated blood at rest.

The lung has to provide for this enormous change in the dimension of its gas-exchanging component during breathing, both at rest and during exercise, but it must do this without causing the complete collapse of the alveoli at the end of each breath, because large mechanical forces would be needed to reopen them. The surface tension properties of the lipoprotein-surfactant lining the alveoli makes this possible. In the neonatal respiratory distress syndrome, surfactant is deficient and the alveoli collapse completely with devastating results. The membrane dividing the blood/air interface must also be as thin as possible to facilitate gas transfer and this is achieved through the specially adapted Type I pneumonocyte whose extended cytoplasm is so fine that the existence of a lining cell layer to the alveolar walls was hotly debated until it was eventually proved by electron microscopy in the 1940s.

The atmosphere in which this gas exchange has to take place is the wrong temperature, the wrong humidity and is contaminated by living and non-living material that is potentially dangerous not only to the lungs but to the body as a whole.

The upper airways are crucial for temperature regulation and humidification of the inspired air and for trapping larger particulate contaminants. Smaller particles deposited on the surface of major airways are cleared by specially adapted epithelial cells with microcilia on their surfaces. The unidirectional action of these cilia, beating synchronously in their own special microenvironment, wafts particles entrapped in tenaceous mucus to the main airways from which they are expelled by the simplest of all mechanical devices—the same bellows that are used for breathing doubling for physical expulsion by a reflexly coordinated cough; a mechanism which is more prominent in humans than most other mammalian species.

Much of the living material that contaminates the
inspired air such as bacteria, viruses and many fungal spores, cannot be dealt with mechanically. Biological adaptation has not been slow to respond. The major airways have their own specially adapted immuno-reactive cells in common with those found in the gut, from which the embryonic lungs are derived. Organic particles deposited onto the airways stimulate specifically adapted antibody in the form of dimers linked through a secretory piece (secretory IgA). Secretory antibody interacts with complement and functions as an opsonising antibody which facilitates the ingestion of potentially damaging antigens by local phagocytic cells. Some individuals are genetically prone to form another locally produced IgE antibody which is of particular importance in allergic responses. The phylogeny of this antibody is still debated and the reason why it has failed to be eliminated during the course of evolution remains mysterious. However, IgE is clinically important because once it is formed in response to antigen challenge (commonly the faecal pellets of the ubiquitous house dust mite, pollen grains and fungal spores) it becomes attached to mast cells distributed throughout the bronchial walls; interaction of antigen and antibody on the surface of these cells liberates a range of inflammatory mediators which dilate local blood vessels, recruit inflammatory cells, stimulate muscle cells and nerve endings in the bronchial wall, causing asthma, a condition which affects at least 10% of children and 5% of adults in the UK and is apparently increasing.

The central conducting airways thus act as sentinels and play a major part in protecting the delicate gas exchanging parts of the lungs from the noxious contaminants of the atmosphere. The airways themselves play no part in gas exchange and their own oxygen requirements are met by their own systemic circulation, the bronchial arteries. Normally the bronchial vessels function in a largely independent way from those of the low pressure pulmonary circulation, but in response to new inflammatory or neoplastic tissues in diseased lung they expand dramatically in a variety of characteristic ways, as well as opening new or preformed communications with the pulmonary circulation.

The fine tracery of the alveolar structures which is so vital for gas exchange, renders them vulnerable to very small atmospheric inorganic and organic contaminants, especially bacteria and viruses from which they must be protected. In the smaller airways and alveoli, IgG antibody responses become more important. Adapted tissue macrophages derived from the bone marrow are the resident policemen of the alveoli. In the process of performing their phagocytic function of mopping up microscopically sized undesirable material reaching the lung, the activated macrophages often liberate several peptide mediators which augment local tissue inflammatory events, recruiting circulating blood cells as a second line of immunological defence.

It is upon this most elegantly structured organ that from the beginning of time man has imposed great challenges to its tolerance. The smoke inhaled from the first fire lit for warmth and preparation of food, was perhaps man’s first contempt of God’s good gifts.

Early observations on the lung and its circulation

According to legend, Emperor Huang Ti (the Yellow Emperor) wrote the canon of internal medicine called Nei Ching sometime between 3000–300 BC. In this is stated that ‘the blood current flows continuously in a circle and never stops. It may be compared with a circle without beginning or end’. Scientific proof of this came, as we all know, much later. It is often difficult to decide how far the early knowledge of the structure and function of the lungs and pulmonary circulation is derived from observations or was a theoretical conceptualisation. Nonetheless, it appears that an understanding of the principles of the pulmonary circulation considerably antecedes that of the systemic circulation.

William Harvey, in his Prelectiones for the Lumleian lecture in 1616, recognised that air is essential to life and combustion but the reason for this remained a mystery. ‘Why and how air is requisite for all animals to breathe as also is air necessary for a candle for fire I (WH) have seen.’ In 1616 he seems to have upheld Galen’s view that the function of the lung was to cool the animal but later, in 1653, changed his mind (Anatomical exercises 1653): ‘Air is allowed to animals neither for refrigeration nor nourishments sake.’ In this same volume he promises us more: ‘but I will say more about this in my treatise on respiration’, however no more seems to have appeared. Thus the only clues to Harvey’s views on respiration come from the 1616 Prelectiones.

The discovery of vital respiratory gases can be attributed to members of the ‘invisible College’, including Robert Boyle and Robert Hooke, who met either in their lodgings or at Gresham College and who in 1662, founded the Royal Society.

Lung research since the beginning of the NHS

As in most fields, opportunities for respiratory research followed closely behind scientific and methodological advances. In the earlier decades pulmonary physiologists dominated the clinical academic scene in respiratory medicine, while pathologists used animal models and light microscopy to study the dissemination of bacterial pneumococci in the lung and described the processes of inflammation in pneumonia and its resolution. The introduction of electron microscopy in the 1940s revealed alveolar and cellular structures in the lung not envisaged before. The development of immunological techniques allowed the special features of local protective immunity in the lung to be studied, at first in local secretions from the
lung and later in mucosal biopsies obtained with relative ease through the introduction of the flexible bronchoscope. In the early 1970s the rapid growth in new immunological understanding defined and characterised antibodies, complement and antigens. Various labelling techniques allowed their identification both in blood and locally in tissues. Lung lavage, developed in the mid 1970s combined with new techniques in cell and molecular biology, opened the way to study living lymphocytes, macrophages and granular leucocytes as well as components of the extracellular fluids. They yielded fundamental information on processes of inflammation and cellular interactions applicable not only to lung disease but to diseases of other organs not accessible by lavage. Immunological and pharmacological labelling techniques have enabled us to identify, in biopsy samples from both airways and alveoli, a wide range of neuropeptides, vasoactive peptides and cytokines involved in cellular interactions. This has added to our understanding of the balance between protective immunity to preserve healthy lungs, and inflammatory processes causing exaggerated local tissue damage in the wake of the body’s attempts to rid itself of the onslaught of tissue damaging agents. It has also given us a better understanding of the evolution of exaggerated immune reactions; for example, the IL-4 mediated switch from IgG to IgE antibody production in certain individuals resulting in asthma.

The study of mucociliary clearance has yielded much information on particulate clearance in normal and diseased lungs. Epidemiological methods have been especially useful in studying infections of the lung and occupational diseases. The value of tuberculin and allergen skin tests to identify populations at risk for tuberculosis or allergic diseases have been valuable epidemiological tools.

**Lung disease and genetic faults**

Molecular genetics now allows us to move forward from clinical descriptions and pathogenesis of lung disease to identify the specific genetic faults rendering one individual more susceptible than another to similar amounts of potentially lung damaging agents. It is probable that with time it will become apparent that most lung diseases do at least in part relate to specific genetic variations on one or more chromosomes. Some of these have already been identified.

The importance of inheritance of certain types of asthma and hay fever has been well recognised since the 1920s. While there is evidence of genetic heterogeneity, probably associated with more than one chromosome, recent studies have identified a gene locus on chromosome 11q13 where variants are predictive of atopy. This has now been identified as the beta subunit high affinity IgE receptor on the mast cell. The way in which it sets the scene for the exaggerated IgE response in allergic individuals is now the subject of intensive study.

The fact that allergies in general, and lung allergic disease in particular, are so common poses the question as to why the body has failed to eliminate the undesirable consequences of this mast cell interactive antibody. It may be that allergic tissue processes are so closely linked with protective immunity that evolution has not been able to separate them. It is perhaps surprising that more work has not focussed on the mechanisms of the switch from IgA to IgE, the main two locally produced antibodies of the major airways. It has been proposed that IgE production in the lung is an atavistic residuum of its embryonic origins from the foregut where IgE is an important factor in protective immunity from helminth infestation in the intestinal tract. There is good evidence that IgA plasma cells in the gut mucosa repopulate the airways lining. If this mechanism also applied to IgE plasma cells, their persistence in phylogeny would be predicted. Whatever the explanation, the fact remains that IgE responsiveness, as reflected in skin tests to common allergens, can be found in at least a third of the population. It is therefore not surprising that allergic disease of the respiratory tract is so common.

Specific genetic faults highlight the elegant adaptive protective mechanism of the lung. The devastating susceptibility of the lung to infections in cystic fibrosis is now known to depend on a single gene defect of the cystic fibrosis transmembrane regulator (CFTR) which, in normal individuals, acts as a channel for chloride ions to move through cells lining the lung—and as chloride moves, so water follows. In cystic fibrosis the defective protein distorts the channel; chloride and water fail to reach the surface of the lining cells of the airways, so that the normal mucociliary clearance mechanism fails; bacterial colonisation thrives and serious tissue destructive infection, especially by staphylococci and Pseudomonas pyocyaneus, follows. This example demonstrates the way in which a defect in a single protein, essential to the maintenance of normal clearance mechanisms in the lung, presents clinically from the later consequences of infection without a primary defect in the immunological protective mechanisms; indeed the immune processes actually show a heightened response.

Another example of a genetically determined structural defect of the lung that renders it susceptible to infections is found in Kartagener’s and in Young’s syndrome where the micro-structure of the cilia on respiratory epithelial cells disrupts their coordinated rhythmic activity. This in turn impairs the mucociliary clearance of bacteria with resulting serious chronic infections of the airways.

The interaction between genetic and environmental factors also plays a part in primary emphysema. This condition arises from a defect in the production of alpha-1 antitrypsin, a protein which inhibits the action of the proteolytic enzyme trypsin. Lung macrophages and white blood cells normally scavenge the alveolar
elements of the lungs and, activated by organic or non-organic matter, produce proteolytic enzymes which destroy organic material, including foreign organisms and protein products of inflammation; thus they contribute to the resolution of inflammation. Proteolysis is normally short lived because an inhibitor inactivates the enzyme and so protects lung tissues. In the genetically determined absence or defect of the inhibitor, unopposed activity of the proteolytic enzyme destroys elastin fibres of the alveolar walls and so causes severe emphysema. Cigarette smoking with continued activation of phagocytic cells in the lungs is a very important factor accelerating the condition.

Genetically determined or acquired antibody or immune cell deficiencies often present primarily as recurrent respiratory infections, especially with less common pathogenic organisms—thus demonstrating the vulnerability of the lungs when the body’s general immunological mechanisms fail.

**Some medical advances in lung disease**

Medical advances depend on much more than just a breakthrough in laboratory based research. The remarkable success story of tuberculosis illustrates the interplay of medicine with sociology, epidemiology, pharmacology, pharmaceutical medicine, as well as an ethical commitment on a world scale. Tuberculosis is an ubiquitous and predominantly pulmonary disease which affects susceptible populations, especially those in overcrowded conditions of poverty and malnutrition. A major advance in reducing its prevalence in the UK was not so much the introduction of antituberculous chemotherapy early in the 1950s, but the improved social conditions which accounted for a 75% reduction in notifications from the beginning of the century, long before drug therapy was available. Another factor perhaps contributing to lower mortality, especially during the 1920s–40s, is attributable to various interventions, such as artificial pneumothorax and thoracoplasty, designed to collapse the lung in order to close tuberculous cavities. Evidence supporting the value of such treatments was suggested if not definitively proved in early case control studies reported from Frimley Sanatorium in 1954. The introduction of combination chemotherapy in the early 1950s added a crucial dimension to success, not only leading to the certain and fairly rapid cure but also the elimination from the NHS of a major tranche of services, including the closure of the network of special hospitals throughout the UK, discontinuation of teams of tuberculosis officers and nurses in their chest clinics and cessation of mass X-ray screening throughout the country. In spite of this gigantic improvement, there is no apparent evidence of even a transient fall in the overall costs of the NHS!

The tuberculosis story also contains another most important message. The exemplary commitment of the Medical Research Council and its Tuberculosis and Chest Diseases Unit not only led the way in pioneering from the beginning the proper conduct of large-scale, long-term, controlled comparative trials to establish the scientific validity of the new therapy, but they went further. Recognising their international obligations, the MRC set up meticulous studies in many third world countries and demonstrated that effective treatment could be delivered to greatly disadvantaged people within the constraints of local culture and at affordable cost.

Many but not all medical advances are made in the exciting environment of the innovative magic of laboratories. Some are developed in the poverty and simplicity of rural communities. However, the story of tuberculosis is not yet over. Its incidence in the USA is now rising again and a similar trend may be starting in the UK. This cannot be attributed to HIV infections alone; it is probably multifactorial and includes exposure of susceptible individuals to others with active disease, especially where there is overcrowding.

In no area has the transformation of medicine by the advent of antibiotics been more important than in lung disease. While pneumonia remains the commonest cause of death, especially in the very young and the old, mortality and morbidity from lung infections has improved dramatically, irrespective of whether it is a primary infection or secondary to other compromising factors including those self-inflicted by tobacco smoke.

Sophisticated respiratory support in intensive care in all age groups and in a wide range of life threatening illneses is now taken for granted and is, in its wake, creating new ethical and philosopical issues. Advances in neonatal life-support developed by the paediatricians have transformed the success of survival of premature infants in a way that few would have envisaged.

The fascination and importance of respiratory medicine is that it includes some of the commonest as well as some of the rarest diseases in man. Spectacular life-saving procedures for some rare lung diseases have pushed back frontiers of therapy and have opened the way to treatment of more common disorders. Heart/lung and lung transplantation for cystic fibrosis gives new hope for this brave group of teenagers and young adults. Genetic engineering is now enabling transfer of the normal CFTR to replace the defective gene and gene therapy is on its way. The world’s first heart/lung transplant patient for fibrosing alveolitis survived for ten years without recurrence of disease. In accord with this is the very recent new evidence implicating local Epstein-Barr virus as a causal agent. Transplant of a single lung allowing a greater economy of organs, is now successful in a range of other fibrosing conditions and also in primary emphysema. Lethal alveolar proteinosis due to massive accumulations of surfactant can be treated with large volume lung lavage. Patients with life threatening acute pulmonary haemosiderosis can be rescued by plasmaphoresis, and other life-
threatening rarities including cryptogenic organising pneumonia, extrinsic allergic alveolitis, cryptogenic eosinophilic pneumonia, and desquamative interstitial pneumonia, can be improved by lung lavage procedures.

Preventive medicine

Because of the vulnerability of the lung to environmental abuse, opportunities for prevention of man-made diseases have been recognised and progressively implemented over the last 100 years. Coalminers' pneumoconiosis, silicosis and asbestosis should all now be diseases of the past. A vast range of other organic and inorganic dusts, minerals and chemicals in manufacturing and mining have been identified through the collaborative efforts of factory medical officers and occupational medicine research groups. More recently, occupational asthma has been recognised to be triggered by a wide range of chemical and organic products, particularly in people who have a predisposition to allergic responsiveness. The work of the Pneumoconiosis Medical Panels, the characterisation of occupational lung diseases and their prevention through health and safety regulations, demonstrates that those concerned with pulmonary disease have led the way in preventive medicine for decades, often requiring industry radically to alter its practices or indeed, as in the case of asbestos, to discontinue production altogether and seek alternative materials. Asbestos has proved to be a fine example where government, through appropriate legislature, has demonstrated that health gains can have priority over massive commercial pressures. A precedent for tobacco perhaps?

Man-made changes to lifestyles in the western world create new domestic hazards. The combinations of central heating, conservation of heat through double glazing with reduced free ventilation, and increased indoor leisure pursuits, especially while smoking, are likely causal factors that increase the hazards to the lung and may relate to the greater incidence of asthma and respiratory infection in children exposed to passive smoking. The devastating effects of Legionnaires' pneumonia from certain humidification processes linked with air conditioning is a less common but very serious newly created hazard. Living conditions on this planet have come a long way since earliest man sought refuge in caves. Over these millennia extraordinarily little attention has been given to the domestic environment he is imposing upon himself.

Tobacco

The havoc wreaked by Sir John Hawkins and Sir Walter Raleigh through the introduction of tobacco is perhaps the greatest contempt of God's good gifts by man, so eloquently described by James I in 1604—when William Harvey was just 26 years old. Theory had suggested that 'the braines of all men, being naturally cold and wet, all dry and hot things should be good for them'. James I in his Counterblast to Tobacco declared 'but herein is not only great vanitie but a great contempt of God's good gifts, that a sweetness of man's breath being a good gift of God, should be willfully corrupted by stinking smoke'. Further he declares with eloquence 'a custom lothesome to the eye, hated to the nose, harmful to the braine, dangerous to the lungs and the black stinking fume thereof neerest resembling the horrible Stigmatic smoke of the pit that is bottomless'. On 5 October of that same year, 1604, William Harvey was admitted as a Member of the Royal College of Physicians. Significantly, the year 1628 should not, perhaps be renowned so much for the publication of De mortu cordis as the year that the Privy Council sent a document to the College in the name of the king (Charles I) for a report on the tobacco made from plants grown in England and Ireland because they feared that it might be 'injurious both to those who smoked it and to the prosperity of the Virginian plantations'. This request was received on 13 October 1628. A working party was set up of six experts and they reported back within three days! '...wee the President and Fellowes of ye Colledge of Phisitians of London should assemble our selues and after mature deliberacion certify our opinions concerning Tobacco of ye growth of England and Ireland wither the use thereof as it is now usually taken as unwholesome and hurtfull to mens bodys as his Magesty is informed... And in our opinion is that as it is now usually taken it cannot be but very unwholesome and hurtful falling short of the perfection of other Tobaccoes that are brought from other more Southern partes where it hath his naturall maturity uiger and efficacy.'

Three hundred and ninety years later and 32 years after the College's first report on the dangers of cigarette smoking, the government not only failed to put to the vote, but talked out a Private Bill to ban advertising of cigarettes. This was despite its declared commitment to reduce cigarette smoking because of its known association with the lung cancer, now the commonest in man and overtaking breast cancer as the commonest in women, its known association with chronic bronchitis, emphysema and cardiovascular disease, and the rigorous research showing evidence of damage caused by passive smoking, especially in children and the unborn infant. Reluctance to take action seems to stem in part from the financial implications and partly from the belief in individual freedoms for people to endanger their own health with a legal product if they so wish. The latter argument does not take account of the fact that the sale of tobacco to young-sters is illegal, that they are particularly susceptible to advertisements, that the product is addictive and that
continued smoking in adulthood is related to the age at which it is started. Surely society has a responsibility to protect its children even if it does not choose to protect its adults.

**Human responsibility for the ‘good’ gift of biological adaptation protecting the body from harmful contaminants**

History demonstrates that man’s contempt of this remarkably adapted organ, the lung, stems from ignorance, self interest in commercial exploitation and indulgent pleasure seeking. At first the hazards of occupational dusts and chemicals were not recognised, later they were often ignored until compulsory legislation was introduced.

The role and responsibility of doctors and scientists must be to define the dangers as rigorously as possible and, more importantly, to influence people towards seeking protection and prevention from proven hazards.

This implies that society has an ethical responsibility to invest in much more medical research. Of great concern is the increasing evidence that pressures associated with the new competitive purchasing procedures in the NHS are inhibiting participation in clinical research, this includes multicentre trials which are so important for the scientific validation of treatment. We should remember that the innovations of today become the routine of tomorrow, and the day after tomorrow also needs to be nurtured. If the difficulties currently faced by many academic centres are not tackled urgently and unless much more is done to protect those who work within them, basic and applied research will be seriously held back and patient care compromised.

The central management of the NHS must not turn its back on a health care system that has allowed huge advances in medicine in the UK since its beginning and which has facilitated so much world acclaimed clinical research in the UK.

**Human responsibility and trusteeship**

The success of the British National Health Service has been applauded worldwide. The quality of the service in relation to the percentage of the gross domestic product spent upon it makes it perhaps the most efficient and cost effective health service in the world. Yet in the late 1980s much discontent was shared by patients, doctors and politicians. A radical review in 1989 was timely. The process of managing the NHS needed to be reviewed and strengthened; to business men the NHS appeared bureaucratic, archaic and sloppy and they had a point. The problem was how to meet the demands of modern medicine and at the same time control escalating costs. The perceived answer lay in efficiency gains and more aggressive competition. The NHS reforms have highlighted many ways of improving health care which are wholly good, especially the more accountable, the more explicit and the more cost conscious environment of the new NHS. Specific improvements such as reducing waiting lists and waiting times for patients needing elective procedures and ideas about reducing lengths of stay in hospital through new types of medical practice, especially working more closely with the community and general practitioners, and more focus on best practices, particularly if these save costs without loss of quality, are all laudable. There is widespread recognition that the NHS must be run in a more business-like way but it is not and cannot be a business. Indeed as businessmen have shown in their own fields, it is not more management that is required but more wise leadership.

However, if real improvement in patient care is the objective, we must now urgently face some of the problems that have surfaced in the new NHS. Defining the difficulties is not made easier when any criticisms by the medical profession of the NHS reforms are dismissed by managers and politicians as stemming from self interest, prejudice or resistance to change. Few if any of the changes in management practices have been subjected to the same careful validation so powerfully advocated for medical treatments. Without proper evaluation, directives on changes in management practices are unsatisfactory and do not promote respect or confidence in those trying to treat patients. Many of the current problems lie in the fact that the seductive theories proposed centrally do not in fact translate into practice at the coalface. Indeed they sometimes seem to be as far apart as Aristotelian theory and the new science based on observation and experiment so well established around the time of William Harvey. These inconsistencies are creating division and controversy between the Department of Health and Trust hospitals—between purchasers and providers, between management and the professions, between politicians and doctors and even between doctors themselves just at a time when there should be unity and trust. Now is the time to listen to the health care professions who are responsible for patients and to recognise the serious pressures on the system which must be resolved before it is too late.

Devolution of purchasing to several different authorities and to individual general practitioner fund-holders, together with the crudeness of many aspects of competitive markets, has inevitably led to an uncoordinated and fragmented system and is disrupting the development of a seamless service and continuity of patient care. In attempts to correct this, an increasing number of central directives are now being issued, blurring the principle of local autonomy and centralised management. Many well intentioned doctrines coming from the centre are sending mixed uncoordinated messages. For example, there is pressure for consultant-led outreach clinics, but at the
same time there is pressure for a consultant-led service at the base hospital, more consultant time for training of junior staff within the constraints of reduced hours, more audit, and more continuing medical education for consultants, and greater participation in management. In spite of strenuous endeavours to adapt, the rapid turnover of patients in the wards and the even more rapid turnover in day-case units often compromise good communication with patients at the same time as the Patients' Charter calls for improvement. More serious, but difficult to quantify, is the erosion of individually designed safe practices developed through experience by doctors ultimately responsible for patients. It is well known that in medicine 'disasters lurk in special arrangements'. Short cuts in supervision or follow-up in the interests of economy erode quality care and are causing great concern. Provider hospitals are being asked to reduce follow-up visits in order that they see new patients more quickly, but they are also being pressed for better outcome assessments. Similar pressures exist in general practice where the expectation of patients has risen, especially since the introduction of the Patients' Charter, but which cannot be met without an increase in manpower. Trying to satisfy these conflicting theoretical ideals in practice causes much frustration amongst healthcare workers and is tempting many doctors to take early retirement. Because of the rigorous limitation on trainees introduced in the government's 'Achieving a Balance' exercise, many specialties are becoming seriously short of adequately trained juniors to fill the consultant vacancies. More seriously, if the NHS is denuded of a tranche of the most experienced doctors through early retirement, the NHS will find itself deprived of some of the most skilled teachers, and the new much needed quality training of junior staff will be difficult to provide. Professional disillusionment in any industry opens the way to a downward spiral of performance, and this in turn triggers an upward spiral of managerial directives. Very urgent action needs now to be taken to review the causes of this dangerous trend. There is still much goodwill in the NHS because doctors and nurses are motivated primarily by helping their sick patients who need care. This goodwill must be built on urgently before it is too late.

Above all, action needs to be taken to correct the underprovision of medical and nursing staff to allow some of the innovative new ideas of the NHS reforms to work. Every report issued by the Department of Health (DoH) over the last few years including 'Achieving a balance', 'The new deal for junior doctors', the Calman and the Campbell reports, has recognised manpower shortages, but improvements have been limited and slow to come. Unless doctors and nurses have more time to look after and talk to their patients, to think about what they are doing and how to do it better, the reforms which promised so much will count for little. Now is the time to re-examine the consequences of competition and re-evaluate the efficiency of much greater collaboration in the planning of modern medical services. Now also is the time to inject some stability and longer term planning into the service so that quality medical teams can be maintained. Fine service units take years to build up, they cannot be created overnight or picked off and returned to the shelf like cans of baked beans in a supermarket. Now is the time to ensure that medical quality controls for patient care are in place before the financially driven compromises lead to patient dissatisfaction and further disenchantment of the health care professions. Now is the time to realise that we need a new humility and a new spirit of partnership between those planning the NHS and those trying to provide patient care.

This partnership has to be based on trust and this trust has to be earned. The fact is, medical knowledge is incomplete and the solutions to the problems of health care management remain tantalisingly elusive. There is a real danger that the doctrines of the new competitive arrangements are driving an ill-founded and misplaced certainty into the system which will jeopardise the very service which purchasers are trying to establish. If this new partnership is to succeed, the only practical way forward to ensure that the views of doctors, who ultimately carry the responsibility for patients, are adequately represented is for many more members of the profession to become more involved in the NHS at the point where strategic decisions are made—be it as chairmen or non-executive members of purchaser or provider boards, or central committees or other arenas of strategic importance. Politicians have now accepted that a greater input from the medical profession is essential if the NHS reforms are to work. In spite of this commendable intention, it is quite inconsistent that among the 139 members of the 12 new 'function groups' recently set up by the NHS Executive to examine particular areas of the new NHS structure only 19 are medically qualified. Furthermore, only about six of these 19 are substantially engaged in active clinical care of patients. It is equally unimaginable that the new Healthcare 2000 initiatives by the DoH include only one general practitioner and one professor of pharmacology and therapeutics—admirable though they are.

The professions, including those in primary, secondary and tertiary practice, have much to contribute and unless their views are taken seriously no new partnership can be established, and a critically important opportunity for the NHS will have been missed. The medical profession must come forward with practical and positive proposals, explaining the uncertainty and unpredictability of medicine, and backing its arguments with the best data available. It must work together to ensure that it is above criticism either from within the profession or outside, so that it can gain the respect of management and politicians. Only in this way can the real interests of patients be protected.
Doctors too have responsibilities

If this new partnership is to succeed, the medical profession needs to reaffirm its responsibilities to ensure that there are no backsliders. It needs to demonstrate that the interests of patients always come before all others. It must seek ways of giving the best value for money in healthcare even if this means adapting and changing its practices so long as their patients do not suffer. It must be receptive to new good ideas and cooperate in testing them. It must be innovative and proactive in introducing improvements. It must always provide good data to back its suggestions and reasoning. It must take the lead in developing standards of good practice with better measurement of outcomes but always remembering how much we do not yet understand. Only in this way can the quality and success of the British NHS be seen by the rest of the world.

The profession should also restate in public its medical ethic to maintain personal responsibility for individual patients. Doctors must continue to build trusting relationships with patients on the basis of mutual respect and understanding. They should provide as much information as possible to enable patients to participate in decisions and choice in their management, recognising that patients’ desire for information may vary. Doctors can only advise, they cannot and should not dictate. Through teamwork with their colleagues they should provide the best continuity of patient care. They should continually seek to improve treatment by keeping up to date with medical advances through discussions with their colleagues and participating in research whenever feasible. They must recognise the potential conflict of interests between the needs of individual patients and the perceived needs of populations which often depends on their relative advantages. There is a real danger of professional ethics being driven off course by managerial directives. If these directives conflict with medical ethics then the profession must stand firm, and clearly spell out to the public why such practices are not in patients’ interests.

To protect the good gifts

To marvel at the capacity of the human body to adapt to an increasingly hostile environment is not enough. Those whose lives depend upon the atmosphere of this planet must play their part. They must continually extend scientific knowledge to protect and prevent human disease and they must foster systems to allow this to happen. While recognising with humility the limitations of our current knowledge, the medical profession must define as far as possible what can be done to preserve and restore human health. Its views must be incorporated in strategic planning of health services through a new and equal partnership between the healthcare professions and the country’s decision makers, based on mutual trust. In this way the problems of the NHS could then be addressed in a new spirit of unity of purpose and it could retain its place as the envy of the world. If those with responsibility and knowledge fail in this collaborative trusteeship of human health, it would indeed be the greatest contempt of God’s good gifts.

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