

## Singular Beneficence?

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In 1900 Sir William Osler, who was the dominant figure in medicine at the beginning of this century, stated that medicine is distinguished from other professions 'by its singular beneficence'.<sup>1</sup> In the title of this address, a question mark has been added because 100 years after Osler made this comment, it is worth reflecting on whether medicine has lived up to his views, and what future medicine will have in the years to come.

In 1949, Lord Horder, a leading London physician asked the question 'Whither Medicine?' His answer was 'whither else, but straight ahead'.<sup>2</sup> Today, 50 years later, do we know where straight ahead is? It is important to consider where we are going in the next few decades, and most important for those who have responsibility for educating the doctors who will practise in the new century.

What was medicine like at the beginning of this century? Two paintings of the time give us some information. The first, the 'Doctor's Visit' by Thomas Faed, belongs to Queen's University and hangs in the foyer of the King Edward Building at the Royal Victoria Hospital (Fig 1). Painted in 1889, it shows the doctor calling at the home of a patient, a man who is clearly very ill in bed, attended by his wife, with a child nearby. At about the same time, in 1891 Sir Luke Fildes painted the picture entitled 'The Doctor' which hangs in the Tate Gallery. Here the doctor is within the home, the patient is a child, and the family is in attendance. A feature of both these portraits is that the doctor comes to the patient's home, what would now be called 'care in the community'. The doctor does not have a bag full of drugs or a prescription pad. What he has is time to spend with the patient. What would be the picture of the doctor today? The television programme 'ER', is perhaps somewhat theatrical but nevertheless illustrates a public perception of medicine. The doctors are young, full of



*Fig 1.* 'The Doctor's Visit' by Thomas Faed, painted in 1889. This painting is part of the Queen's University of Belfast collection and hangs in the King Edward Building of the Royal Victoria Hospital.

enthusiasm, surrounded by high technology, with, as a badge of office, stethoscopes around their necks.

Medicine has advanced enormously in the last century, particularly in the last 50 years and what it can now do for patients is unrecognisable compared to what Osler would have written in his textbook. Nevertheless there is what Le Fanu has described as a fourfold paradox.<sup>3</sup> Medicine has never been more powerful in its ability to deliver care and yet:

- doctors are less professionally fulfilled
- the public is neurotic about its health
- alternative medicine is on the ascendancy
- there is an explosion in health service costs

#### TUBERCULOSIS

Tuberculosis is a disease which has had a prominent role, not only in medicine, but in our

culture and our history.<sup>4</sup> Many of those in the world of art, literature and music have themselves succumbed to this disease and have also used tuberculosis as a theme in their work. It also has an interesting connection with the specialty of geriatric medicine. The rise in the need for specialist facilities for ill and disabled elderly people happened to coincide with the decline in the need for hospital care for patients with tuberculosis as effective treatment became available. As a result many of the sanatoria became geriatric units and some of the pioneers in geriatric medicine were originally tuberculosis specialists. It is interesting to speculate on how this coincidence has influenced the development of the geriatric specialty.

Tuberculosis is a disease which was known in antiquity and is surrounded by mythology. It has had a wide variety of names throughout the years. Perhaps the best known is 'consumption'; it was also known as the 'white death' because of the pallor often associated with the disease and of the treatment, and in John Bunyon's phrase as 'the captain of the men of death'.

#### KEATS

Three writers, who were also doctors, died of tuberculosis – Schiller at the beginning of the last century, and Chekhov at the end. In between these was Keats<sup>5</sup> (Fig 2). John Keats in fact took very little interest in medicine. Indeed he



Fig 2. John Keats. Stipple engraving by C W Wass, 1841. Wellcome Institute Library, London.

composed one of his best sonnets 'Much have I travelled in the realm of gold' while attending a lecture on the pathology of the liver. The first real knowledge that he had tuberculosis was when, after a fit of coughing one night, he found his pillow covered in blood. Keats had to endure a great deal of suffering, including the ritual journey to Italy. When he arrived there he had the misfortune to come across an English doctor, who, looking at the emaciated, pale, coughing young man hardly strong enough to stand, decided that there was no physical illness, that it was all in his mind and that what he needed was exercise. He died in 1821, aged 26. His great contemporary, Shelley, who was not medical, also suffered from tuberculosis but was drowned in a boating accident before he could succumb to the disease.

What is striking was the immense suffering that Keats underwent, much of it the responsibility of the doctors of the time. Sir George Pickering, a recent Regius Professor of Medicine in Oxford, has stated that 'the history of medicine is a monument to human folly'. In Keat's time the standard treatment for any condition was bleeding. Keats was bled until he was practically unconscious. The more blood he coughed up, the more he was bled. A most striking example of this folly is the account of a major-general during the battle of Waterloo who came across a severely wounded soldier being attended by a young doctor.<sup>6</sup> His first thought was to marvel at the devotion of the doctor attending a wounded soldier while under fire, but when he looked more closely he discovered to his horror that the soldier had a huge wound in his thigh from which his femoral artery was gushing blood at a great rate, while the doctor was trying to find a vein in the soldier's hand in order to squeeze out some more blood.

#### MODERN MEDICINE

Can we be sure at the end of the 20th century that we still don't have treatments that we administer by custom rather than by thought? Sir David Weatherall, the current Regius Professor of Medicine at Oxford, and a most distinguished haematologist, in an editorial with the title 'The Inhumanity of Medicine'<sup>7</sup> has commented that patients with cancer are often subjected to the most intensive protocols of chemotherapy, some of which require them to be taken to death's door in an attempt to eradicate their tumours. But this is what is currently believed to be the most effective way to manage these diseases; in almost

every field of modern high technology patch-up practice, patients are pushed to the extremes of their endurance, and not always for reasons that include a careful appraisal of what is meant by quality of life. One hundred years hence we may look back on this in the same light as we do on bleeding today.

### PERCUSSION

At this time, however, some important medical advances occurred which have survived to the present day. The names of the people concerned are largely forgotten. The first is Leopold Auenbrugger<sup>8</sup> (Fig 3). Auenbrugger's father ran an inn, and Leopold had a musical ear, and probably from watching his father tapping the flasks of ale to detect whether they were empty or full, he developed the clinical technique of percussion. In this way he was able to detect, for example, tuberculous cavities and pleural effusions. What Auenbrugger described was direct percussion, in which the fingers were tapped on the chest wall. Corvisart, the most fashionable doctor of the time, adopted this technique and devised the pleximeter, a small disc made of silver or bone, usually with an ornate handle, which was placed on the surface of the chest, and this in turn was tapped with the finger. A further advance was made by an English physician whose name has been lost in history. He came to percuss a patient in Corvisart's clinic, discovered that he had forgotten to bring his pleximeter with him, and being not only forgetful but also innovative, he used the finger of his left hand in its place. Hence the method which we still use today was



Fig 3. Leopold Auenbrugger and his wife. Wellcome Institute Library, London.

devised. Medicine is a very conservative profession. Even such a familiar technique as percussion was controversial in its time. Auenbrugger was moved to say 'it has always been the fate of those who tried to improve their arts or sciences to be beset with envy, malice, hatred, detraction or calumny'. He could have added 'or to be ignored'.

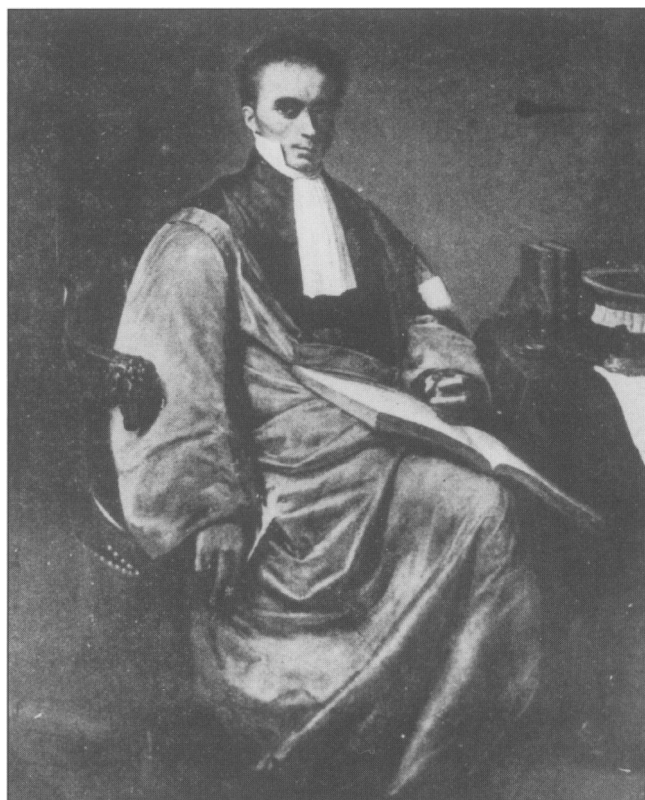


Fig 4. Rene Theophile Hyacinthe Laennec. Reproduction of painting. Wellcome Institute Library, London.

### THE STETHOSCOPE

One of Auenbrugger's near contemporaries was Rene Theophile Laennec<sup>9</sup> (Fig 4). Laennec is one of the major figures of the last century, an intellectual genius, who himself died from tuberculosis. Laennec is remembered for the development of the stethoscope. The story is well known, whether true or not. The sounds of the heart or the lungs, if listened to at all, were heard by the physician placing his ear directly on the chest (Fig 5). It is said that Laennec had a patient, a young, beautiful aristocratic woman, and as he was embarrassed to put his ear to her chest, he took a piece of paper, rolled it up into a tube, and listened. The truth appears to be that it wasn't so much the lady's aristocratic birth but her plumpness that impeded Laennec and that it wasn't



Fig 5. Direct auscultation. Wellcome Institute Library, London.

to keep himself at a distance from her that he rolled up the piece of paper but because he was aware that sounds often were transmitted better by a piece of material. Of course, since then the stethoscope has become not only an essential diagnostic tool, but the badge of office of doctors everywhere. Until the second world war, nurses were not allowed to take blood pressure because that required the use of the stethoscope and the stethoscope was regarded as an exclusively medical skill. It wasn't simply the invention of the stethoscope for which Laennec's reputation developed, but because of the use he made of it to explore disease.

#### CLINICAL SKILLS

Two hundred years later percussion and auscultation are still regarded as essential clinical skills and medical students continue to struggle to acquire them in their introductory clinical course, and now in the Clinical Skills Education Centre. Indeed medicine must be one of the few professions in which skills learnt as a young student and which were first developed two hundred years ago, are retained as core skills throughout a professional lifetime.

But is this right? Have we not advanced in the last 200 years? Few doctors today, certainly those working in hospital, would ever diagnose a chest condition without at least an x-ray, or a cardiac murmur without an echocardiogram. Obstetricians and midwives until recently used a stethoscope similar to Laennec's to listen to the fetal heart but have now moved to electronic means; physicians however continue to rely on their ears and a piece of tubing. Are we simply wasting the time of our patients and our own? What is surprising is how little evaluation there has been on the accuracy and reproducibility of clinical examination. It is surely time for basic clinical skills to be properly evaluated. The results of studies that have been carried out are not reassuring – clinical examination of the chest is only about 50% accurate.<sup>10</sup> There is of course a ritual to the clinical examination, a type of bonding between the doctor and the patient which should not be dismissed, and a physical examination does have a screening function. Physical signs also illustrate pathology and are useful for teaching. But if we are honest, how many of us actually find the signs after we know the diagnosis? It is time that we reviewed the exact place of physical examination in the care of patients, and decided what is useful, what is superfluous and what is frankly misleading. Do we have so little confidence in our role as doctors that we cannot discard some of the rituals of our profession?

#### THE BRONTËS

The Brontës have a Northern Ireland connection. Their father, the Rev Patrick Brontë, was brought up near Rathfriland and went to Cambridge University, which must have been a remarkable achievement at that time. He settled in Yorkshire at Haworth where he reared his family in austere circumstances. There were in fact six children, five girls and one boy. The girls were sent to a ghastly boarding school which formed the basis of Lowood School in Charlotte's 'Jane Eyre', where almost certainly they became infected with tuberculosis. Two of the girls, Maria and Elizabeth, died of the disease at the ages of 12 and 11. The next to die was Branwell in 1848; three months later Emily died at the age of 29, and very soon after, Ann at the age of 27. Charlotte continued to live in the by now lonely parsonage with her father. In 1854 she married her father's curate but her tuberculosis advanced and she died

at the age of 39 during her only pregnancy. Their father incidentally lived to the age of 89.

### VIRCHOW AND PASTEUR

In the second half of the 19th century major advances revolutionised the understanding of management of tuberculosis. The first was Virchow's development of cellular pathology. Virchow was also a politician and had several differences with Bismarck. Bismarck said of Virchow 'he regards politics as an extension of public health'. The second, about the same time, was Pasteur's germ theory of disease which resulted in huge advances in knowledge, and ultimately treatment of infectious diseases.

### KOCH

Pasteur of course did not discover the organism which causes tuberculosis. This was the achievement of the German pathologist, Robert Koch<sup>12</sup> (Fig 6). Koch graduated in medicine with honours at the University of Gottingen, a leading medical school at the time, and he went into rural general practice in the small Prussian town of Wollstein. On his 28th birthday his wife surprised him with a present that was to change their lives. She gave him a microscope. The microscope had been developed 300 years before chiefly by Leeuwenhoek. Koch's microscope was by



Fig 6. Robert Koch, Lithograph, 1891. Wellcome Institute Library, London.

present-day standards a fairly modest instrument of the sort that 10-year-old children might nowadays receive as birthday presents. Koch taught himself microbiological research, improvised techniques, and was meticulous to a fault. As a result of his work he moved from general practice to the Imperial Institute in Berlin. He made an accidental discovery in his laboratory which has striking similarity to the accidental finding in Fleming's laboratory many years later which led to the discovery of penicillin. A boiled potato cut in half had been left uneaten in the laboratory by a careless or perhaps overworked technician. The following morning Koch noticed bead like growths on the cut surface, a whole series of speckles on the potato. It was Pasteur who said 'chance favours the prepared mind'. Koch's prepared mind theorised that each colony represented the multiplication of a single organism and he used this to isolate pure strains of bacteria. He also realised that simply finding what appeared to be an organism in a tuberculous lesion was not enough to prove that the organism caused tuberculosis. He therefore developed the four postulates or conditions under which cause could be inferred. These were:

- the organism must be found in every lesion;
- it should be capable of being cultivated pure outside the body for several generations;
- after pure culture for sufficient length of time, and for several generations, it should be able to reproduce the original illness in laboratory animals;
- the organism can be retrieved from the inoculated animal and cultured again.

### SCIENTIFIC MEDICINE

It is not so much the content of these simple postulates but their style that is important. Koch can be justifiably regarded as the father of evidence-based medicine, one of the new pieces of jargon of this decade. A preferable term is 'scientific medicine'. Scientific medicine has been defined as 'the prevention and management of illness using methods that have been subjected to the same kinds of rigorous experimental, statistical and observational scrutiny that are applied to other branches of science'.<sup>13</sup> Presumably 'scientific' is not used because of the negative public perception of science. Evidence-based medicine must be treated as what it is, the proper scientific approach to the prevention, diagnosis

and treatment of disease, based on sound research, not as a panacea for reducing costs.

The history of medicine is disfigured by the treatment that is meted out to patients based on no evidence or even lacking in common sense. In the treatment of tuberculosis, examples are the use of sanatoria, trips to Switzerland, various surgical devices such as pleurodesis, thoracoplasty, phrenic nerve crush, and many compounds, some of them shortening life or certainly reducing its quality. None of these were based on any evidence whatsoever. Evidence-based medicine is the basis of quality in healthcare. It must, however, be used judiciously in assessing the vast spectrum of care which is delivered. Absence of evidence does not mean that a service or treatment is not effective, just that we do not know. Many aspects of quality of care are difficult or impossible to measure.<sup>14</sup> Those aspects of life – coping with bereavement for example – that are difficult to measure must not become a lower priority than aspects – such as survival or function – that are easy to measure. The first triumphs of evidence-based medicine were the demonstration that doing nothing was better than bleeding, leeches or purging. The application of evidence, usually derived from studies of large groups of subjects, to the treatment of individual patients will remain a challenge to the practising doctor. Epidemiology should take a critical look at some of its methods, in particular the relationship of biological significance to borderline statistical significance in studies of very large populations. Scientific medicine will remove the distinction between orthodox medicine and alternative medicine – there will simply be medicine that works and medicine that doesn't.

## RÖNTGEN

At the end of the century Röntgen (Fig 7) discovered X-rays<sup>15</sup> and this resulted in huge advances in diagnosis and treatment. Pasteur and Röntgen were responsible for advances in medicine, which are as well known to the general public as to doctors, but neither was medically qualified. Pasteur was a chemist and Röntgen a physicist. There are many other examples of scientists contributing greatly to medical knowledge. This is likely to be an increasing feature of future medical advances. However, science has become so complex and so specialised that it is impossible for the average doctor to keep up with, let alone advance, the scientific basis of medicine.



*Fig 7.* W C Röntgen, Professor of Physics at Giessen, Wuerzburg and Munich, discoverer of X-rays. Wellcome Institute Library, London.

## MEDICINE AND SCIENCE

A question for the years to come is the relationship between science and medicine and where doctors fit in, both in medical practice and medical research. The major role of the doctor is the application of scientific advance to the diagnosis and treatment of disease. In order to do this doctors must understand the scientific basis of medicine, but clearly no doctor can be at the leading edge of physics, chemistry and biology, or even any one of these. Likewise scientists must be aware of the possible medical applications of their work. Some would suggest that recent curricular reforms in medical education have removed science from the course and replaced it by topics such as communication skills and ethics, although nobody would question the importance of these. There are even those who suggest that a scientific education need not be a prerequisite for entry to medical school. Yet if doctors cannot at least understand the scientific basis of medicine, how are they going to practise effectively to the benefit of their patients? One answer to this dilemma would be for medical education to become a graduate subject. Before entering medical school the student would take a primary degree. Some might take a degree in advanced science, others for example might take an

American type liberal arts degree, which would include enough science to allow the graduate to understand the scientific basis of medicine. Modern modular degrees provide scope for imaginative degree pathways. This would then be followed by the medical course, which would be shorter than our current five year curriculum, and may well be taken at a different university. The standard North American course, where graduate medical education is the practice, is four years, although the University of Calgary has a three-year medical course. Such a change in medical education might not only have the advantage that the doctor could study in detail a subject, other than medicine, it might also help widen access to medical education, and might allow better means of selection to university on behalf of both the medical school and the aspiring doctor. There would of course be complex financial implications to such a change but they should not prove insurmountable. This is one of the challenges which medicine must face and must tackle soon.

#### **SPECIALISED HOSPITALS**

One of the features of tuberculosis was the development of specialised hospitals. In London four specialised hospitals were developed in the last century, the oldest and best known being the Brompton Hospital, founded in 1842.<sup>16</sup> The Brompton nominally had 300 beds but for most of the 19th century, at least half of the beds were regularly empty because of lack of funds or lack of nursing staff, or both. Sir William Whitla in his presidential address to the British Medical Association meeting in Belfast in 1909, noted that the Royal Victoria Hospital had 300 beds, of which only 266 were occupied and the Mater Hospital 150 beds and only 122 occupied.<sup>17</sup>

#### **SPECIALISATION**

Tuberculosis, because of its nature and infectivity was always regarded as a specialty and had its own hospitals and medical staff. Indeed until the 1960s there was a lectureship in tuberculosis in the Department of Medicine at Queen's. Tuberculosis must be one of the few specialties if not the only one, which has declined as a result of advances in treatment; the opposite is usually the case. As knowledge advances, as investigation and treatment of disease become more complex, they are best undertaken by doctors who devote their lives and their attention to these particular

subjects. Doctors who spend a great deal of their time dealing with particular conditions become more expert at them than those who have less experience. This of course has implications for the organisation of medical care and for the future training of doctors. It also has implications for patterns of care. Is there a future for the generalist? Should we be training generalists or specialists?<sup>18</sup> It seems clear that to have the highest quality in most branches of medicine, specialists are required. However, if we repeat the same question, but change the wording slightly – do we wish to be treated by a generalist or a specialist, the answer is not so clear. Many patients have more than one disease, many diseases affect more than one system in the body, and in any case who is going to select the correct specialist for the patient presenting with disease for the first time, a very important decision? Another of Osler's aphorisms was 'the good physician treats the disease, great physician treats the patient'.<sup>19</sup> There will be a continuing need for generalists who will take an overview of the whole patient but the exact role of that person, their training and their relationship to the specialists, is still not clear. Whether generalists will themselves also have specialties is also not clear but seems most likely. Generalists of course continue to exist in general practice, in accident and emergency medicine and in care of the elderly. They might be all that are required. The balance between generalists and specialists will be one of the most difficult problems in the future. Clinical governance, appraisal and revalidation will give an added impetus towards specialisation, with all the implications that this will have on staffing a health service which now has the lowest staffing levels in the western world.

#### **RESOURCES**

Another issue is the use of resources and the associated word 'rationing'. There is no doubt that some type of rationing is necessary. What needs to be decided is the basis for the rationing and who will administer it. Will it be the doctor, or will it be somebody else? An interesting debate on this issue occurred recently in the *New England Journal of Medicine* and the *British Medical Journal*. The editor, now former editor, of the *New England Journal*, takes the view that doctors should have nothing to do with rationing. 'When patients are sick and vulnerable, they expect their physicians to be their advocates for optimal care, not for some minimalist standard'.<sup>20</sup> Another

Boston physician responded "To be truly excellent clinicians we must love our patients and that makes us want to do as much as possible for each person's health. To be truly responsible citizens, however, we must do as much as possible for the population's health within available resources. This commitment to fairness requires us to embrace priorities and rationing. In the United States we call love for patients fidelity and seeking fairness for the population stewardship. Since priority setting and rationing inevitably deprive identifiable people of potential benefits, the question for practising clinicians is whether they can embrace fidelity and stewardship in their dealings with patients".<sup>21</sup> Richard Smith, editor of the *British Medical Journal*, goes further and states that 'any system that makes one set of players think about quality and another about cost would experience unresolvable conflict. The better system is to oblige all players to think about quality and cost'.<sup>22</sup> It has been clear for many years that no country in the world, no matter how wealthy, can afford all the medical care that it is possible to provide, nor is it always appropriate in the individual patient to provide all medical care that it is available. The combination of scientific medicine, quality standards and ethical principles should help us address these very difficult issues. Doctors must continue to be advocates for their patients, but must not opt out of their responsibilities as unusually well-informed citizens to advise on the best use of limited resources.

#### PREVENTION AND TREATMENT

The picture of tuberculosis changed dramatically with the advent of immunisation and then chemotherapy, first streptomycin in 1948 and then the other drugs.<sup>23</sup> The sanatoria started to empty and chest physicians diversified their activities. The disease was conquered. But was

it? In 1997 over 7.3 million people developed tuberculosis, and 3 million died of it, more than for any other infectious disease.<sup>24</sup> There are two major reasons for this. One is the increasing number of susceptible people, particularly those suffering from AIDS. About one third of the incidence of tuberculosis in the last five years can be attributed to HIV. The other is the development of resistance to standard treatment.

#### EQUITY AND GLOBALISATION

Three issues will be important in healthcare over the next few years, quality, resources and equity. Quality and resources have already been discussed. Equity tends to be considered in local terms. A feature of the years to come is what has been described as 'globalisation'.<sup>25</sup> Chris Patten, in his book 'East and West' puts it more dramatically – 'in recent years globalisation has become the five-syllable terror of the political economy'.<sup>26</sup> He goes on to say that 'the notion that what it represents is new is laughable'. In fact globalisation was a feature of the end of the 19th century with huge migrations of population and free trade throughout the world. Globalisation is usually thought of in terms of transfer of information and of money but it ought also to be considered in terms of health and disease. Is it acceptable that 7 million people develop tuberculosis, a preventable and treatable disease? Despite the advent of drug resistance, it is possible to treat the condition and it is merely a question of resources. The resource issues which are discussed in this country are totally different from those in so many parts of the world. Huge amounts of resources are spent to keep alive, sometimes for a very short time and in a poor quality of life, very small numbers of people in western countries, when millions are dying from conditions which could be adequately treated with much less cost. Surely this is unacceptable

*Figure 8*  
HIV/AIDS

1981	First recognised
1983	HIV-I isolated
1985	HIV-2
1985	Zidovudine (AZT)
1986	First trial reported

*Fig 8.* The Discovery of HIV/AIDS

*Figure 9*  
vCJD

1985	BSE first identified
1986	BSE shown to be a prion disease
1990	'Beef is safe to eat' (repeated 1993)
1995	vCJD first identified
1996	BSE linked to vCJD

*Fig 9.* The Discovery of vCJD



to a caring profession. We must globalise our notions of equity.

#### THE CHALLENGES OF SUCCESS

There have been great advances in improving health care, particularly in the western countries, but each new success brings its own challenges.

#### *Speed of Advancing Knowledge*

The first is the speed at which knowledge is advancing. Knowledge of tuberculosis has developed over centuries and this has led to at least some degree of control and containment of the disease. Compare this with two modern diseases. AIDS or HIV was first described in 1981.<sup>27</sup> Very rapidly, because of the existence of research laboratories in immunology and other relevant disciplines, its nature was discovered, the virus identified, and treatment, perhaps not yet fully effective, has been developed (Fig 8). This is a justification for so called pure research

because if the researchers had not been there, the ability to advance our knowledge of this disease would have been severely curtailed. Curiosity driven research must be encouraged. Indeed, Peckham has challenged us to quote any examples of the success of directed research.<sup>28</sup> Because science attempts to discover what is unknown, it is inherently unpredictable. It should be recalled that research on DNA in the 1950s and 60s, driven entirely by curiosity and with no practical implications in mind, has resulted in the biotechnology industry, the human genome project and new understanding of many diseases. Variant Creutzfeldt Jacob Disease was first described only a few years ago and is caused by a totally new type of infectious agent.<sup>29</sup> Knowledge has rapidly advanced but unfortunately there is yet no treatment available (Fig 9). Compared with knowledge of tuberculosis, these diseases have been known for

			Microscope Leeuwenhoek	1660 1632-1723
1800	Schiller	d 1805 a 46	Percussion Auenbrugger	1772 1722-1809
	Keats	d 1821 a 26	Stethoscope Laennec	1818 1781-1826
	Maria	d 1825	Cellular basis of disease	1858
	Elizabeth	d 1825	Virchow	1821-1902
	Bronte	Branwell d 1848	Bacteria	1878
		Emily d 1848	Pasteur	1822-1885
		Anne d 1848	Tubercle Bacille	1882
		Charlotte d 1854	Koch	1843-1910
			X-Rays Röntgen	1895 1845-1923
1900	Chechov	d 1904	BCG	1921
			Calmette	1863-1933
			Guérin	1872-1961
	D H Lawrence	d 1930	Streptomycin	1946
			PAS	1948
	Orwell	d 1950	Isoniazid	1952
			HIV/AIDS	1981-1986
			vCJD	1985-1996

Fig 10. Calendar shows on the left some literary events and on the right some major events in the history of medicine.

a tiny amount of time (Fig 10). Future doctors will have to be able to assimilate rapidly advancing knowledge. Our patients will also have access to this knowledge through the Internet so doctors must be able to deal with well-informed patients, perhaps better informed than the doctor at the time of consultation. Patients will have access to medical knowledge without the need for the doctor as an intermediary. This will shift the balance of power from the doctor to the patient.

### *Ethical Issues*

The second challenge of success is the emergence of ethical issues in the application of medical technology. They tend to concern issues surrounding conception at the beginning of life, and issues at the end of life. Ethical issues are not the prerogative of doctors alone, or indeed of professional ethicists. The community as a whole must decide what value it places on prolonging life, as well as the use of resources and other issues, some of which I have mentioned.

### *Ageing*

The third challenge of success is the ageing population. Ageing is not new. It is its extent that is new. One third of everybody aged 65 or over who has existed in the whole history of humankind is alive today.<sup>30</sup> The world population aged 65 and over is increasing by three quarters of a million people per month. In the next 25 years it is estimated that the population aged 65 and over will grow by 88% whereas the working age population will grow by only 45%. Clearly this will have huge implications, not just medical, but on society and the economy and we must be prepared for these. Population ageing has implications for all countries and in the 21st century one of the biggest challenges will be how best to prevent and postpone disease and disability and to maintain the health, independence and mobility of an ageing population. Healthy life expectancy is influenced by a relatively small number of chronic disabling conditions that become more common with increasing age. These must be tackled as high priorities. Knowledge of the human genome and other advances will undoubtedly help in this. The ageing population is a fifth paradox in modern medicine. Despite the huge increase in survival into old age, people seem to be obsessed with death rates from heart disease, cancer and other conditions. While premature death must be prevented, every life is

finite. As well as globalisation, Dahrendorf has identified the 'death of utopia' as a characteristic of the end of the 20th century.<sup>25</sup> People, he writes, no longer believe in perfection. This does not seem to be the case in health and medical care.

### *Change*

We are in a period of immense change. Proust has stated that every generation believes that change is happening more rapidly in its generation than in any other. There may be some justification for that statement at the moment. How, therefore can we cope with a rapidly changing subject in a changing world? We have to establish some fixed points around which change can occur. We must go back to the values of medicine<sup>31</sup> and maintain these as the fixed points around which our profession will move with technological and other changes. Of the values, competence is clearly what patients first desire from their doctor. Defining, teaching, assessing and re-assessing competence will be challenges in the years to come. But competence is not enough. A machine could be competent. Communication is clearly important, and caring and commitment are vital.

### **FUTURE DOCTORS**

Each year it is my privilege to present the new medical graduates at the graduation ceremony. I envy those starting their medical careers now. I am well aware of the problems of junior doctors. We take delightful, caring and extremely gifted young people into medical school, we make a huge effort to provide them with a high quality medical education, and then we subject them to enormously long hours, sleep deprivation, sometimes starvation, and substandard accommodation. How is it that on the one hand there is expansion of medical schools to cope with a shortage of doctors, while at the same time many of our brightest young doctors are stagnating in dead-end so-called training posts, or are working as perpetual locums because there are no career posts available. These problems are real and they are a disgrace to the profession. It is time the profession took ownership of these problems. They could be resolved tomorrow if there was the will to do so. Despite all of this I envy our young doctors because I believe that they are entering a period of unparalleled and exciting advances in our understanding and treatment of disease, the best opportunity for beneficence that we have ever had.

## THE GOALS OF MEDICINE

'The goals of medicine', Osler stated in 1902, 'are to wrest from nature secrets which have perplexed philosophers in all ages, to track to their sources the causes of diseases, to correlate the vast stores of knowledge so that they may be quickly available for the prevention and cure of disease – these are our ambitions'. These goals are as relevant at the end of the twentieth century as they were at its beginning.

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