From Cullen to Calman. Medical education — enlightenment to post-modernism

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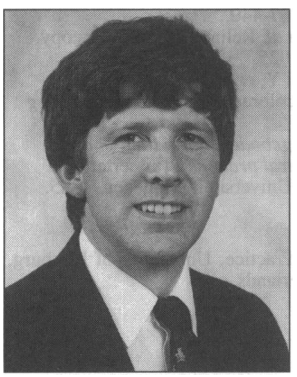

Introduction

THE PRESIDENT of the Royal College of General Practitioners, Alastair Donald, has been my mentor for over 25 years and, by reference to our roots in clinical medicine, I hope to show the influence which mentors have had in transmitting the values which are the heart of medicine. William Pickles showed through his work that it is not only possible for country doctors to make major scientific contributions, but also be leaders in the field of medical education.[1] The country doctor, therefore, is the second theme I shall be addressing. My third theme is the relationship between science and the humanities, and for my introduction to this subject I thank the Thames Valley faculty of the RCGP whose invitation to give the first Tom Stewart memorial lecture stimulated me to start an exploration of the assertion that general practice is culturally determined.

Leiden and Boerhaave

In giving this lecture in the city of Portsmouth, steeped in the history of the navy and naval medicine, I am encouraged to begin my story in 1574 in the Netherlands, when ships made a crucial contribution to our collective inheritance in medical education. The city of Leiden, which was the focus of revolt by the Dutch against Spain, had been under siege for months and was on the brink of surrender. William the Silent was in despair and at prayer in a small chapel 12 miles away in Delft. Although Leiden was five miles from the sea, warships saved the besieged burghers. For several weeks the Dutch had been breaching the sea dykes which normally protected the city. The water rose slowly until on 1 October 1574 a strong wind blew from the west and the sea surged in at high tide, allowing the flat-bottomed ships to sail across the submerged countryside and rout the Spanish army. In gratitude to the citizens of Leiden for their fortitude in holding out through the siege, William offered them the choice of freedom from taxes for 10 years or the foundation of a university. To the lasting benefit of medicine and medical education they chose culture over commerce and their university was inaugurated on 8 February 1575. Within a century, Leiden became the foremost centre in Europe for the teaching of medicine, culminating in the career of Herman Boerhaave.

Why should the small city of Leiden have become so prominent? I believe the reason lay in the humanism which had taken root in the Low Countries from the days of Erasmus and expressed itself through art and architecture as well as through medicine. The Dutch had adopted the dictum of Alexander Pope, 'the proper study of mankind is man', two centuries before he wrote it.

Although Boerhaave was famous in his day for his systematic approach to medicine, his lasting legacy is his method of teaching which was based on cases and clinical observation rather than the reinterpretation of the orthodox texts. Contemporary accounts portray him as a warm and engaging personality.[2] In preparing for this lecture I came across the charming story of musical collaboration between Boerhaave and a young doctor from Penicuik in Scotland, which gives an insight into the breadth of his relationship with his pupils.[3]

I could have entitled this lecture from Boerhaave to Buckley; I chose the less egocentric title of 'From Cullen to Calman' to indicate our collective inheritance in medical education and its Scottish flavour. The link between Boerhaave and Cullen is clear, and the thread to our present chief medical officer will be followed. The Dutch will figure again in the story.

Edinburgh and Cullen

It is estimated that 600 of the 2000 medical students taught by Boerhaave came from the English speaking world and of these many came from Scotland.[2] Pitcairne, one of the founders with Robert Sibbald of the Royal College of Physicians of Edinburgh, was briefly a professor in Leiden. All the founding members of the faculty of medicine in the University of Edinburgh were pupils of Boerhaave and one of the early students in this new Edinburgh medical faculty was my hero William Cullen, the outstanding country doctor.[4]

Cullen was outstanding in many ways, but in his origins and education he was typical of his age. He was born in 1710, the son of the factor to the Duke of Hamilton and as such a member of the minor gentry, the source of most medical students then and now.[5,6] He went first to Hamilton Grammar School in Lanarkshire, then to the University of Glasgow where he completed a general arts course before becoming apprenticed to an apothecary and spending a year as a ship's surgeon in the West Indies. This is an interesting approach to medical education in which vocational training precedes theory. The rigours on board ship in the 18th century have been well described by another Edinburgh medical graduate, Tobias Smollet, in *Roderick Random*.[7] His hilarious account of gaining the necessary naval entry certificate at the College of Surgeons in London indicates that in assessment at least, medical education has advanced in the last two centuries.

Cullen returned to Scotland after a further spell as an apprentice to an apothecary in London to become a medical student in Edinburgh. He also undertook private study in philosophy and helped found the Royal Medical Society, the student debating society which continues to flourish.

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Country doctor

After completing his studies in Edinburgh, William Cullen returned to Hamilton to become a country doctor. The term general practitioner had not then been invented and country doctors could be physicians, apothecaries, surgeons and male midwives.[5] The distinction between physicians and apothecaries which applied in London and to a lesser extent in other cities did not extend to country practice. Cullen was personal physician to the Duke of Hamilton and his household. The account books which he kept show the medicines which he supplied, not only for the duke and his household, but also for the horses and dogs (Figure 1). A comment on the period is that the cost of medicines for the horses frequently exceeded the potions for the household.

William Cullen had a remarkable influence on medicine through his pupils and colleagues while he was a country doctor in Hamilton. One colleague in Lanark was William Smellie who borrowed textbooks from Cullen before leaving for London to stay in the household of another learned Scot, James Douglas (after whom the pouch is named). Smellie became, along with another pupil of Cullen, William Hunter, the founder of modern obstetrics. Hunter was Cullen's assistant for four years and both men described their years in Hamilton as the happiest periods of their long and successful lives. Cullen was family physician to the Hunter family and William Hunter's sister died in Cullen's arms. Death was never far away in the 18th century, particularly through the risks of infectious diseases for doctors and their families. William Hunter survived another of the common hazards of the era when he narrowly avoided shipwreck on his way south from Scotland to London. William's equally famous brother John, increased the risks to himself by experimentally injecting himself with a range of noxious substances.

Professor Cullen

For several years William Cullen resisted invitations from Glasgow to lecture in chemistry. He gained his MD at the University of Glasgow while in Hamilton and his fame had spread. His popularity was so high in the town that a petition was set up to try to persuade him to remain. However, in 1744 he started to give lectures in chemistry in Glasgow and took as his assistant his next famous pupil, Joseph Black,[8] the discoverer of carbon dioxide and, with Cullen, the person who first accurately described the latent heat of evaporation.

Cullen was soon persuaded to leave Glasgow for Edinburgh where he ultimately became professor of medicine and enjoyed an international reputation as a teacher similar to that achieved by Boerhaave earlier in the century.[4] Aspiring doctors from North America in particular made the hazardous journey to Edinburgh for their education. It is somewhat ironic that Cullen was criticized in his latter days for departing from the system of Boerhaave. Non-conformity soon breeds its own orthodoxy.

Scottish enlightenment

As with Leiden in the 17th century, why did Edinburgh gain such a prominent position in medical education in the latter part of the

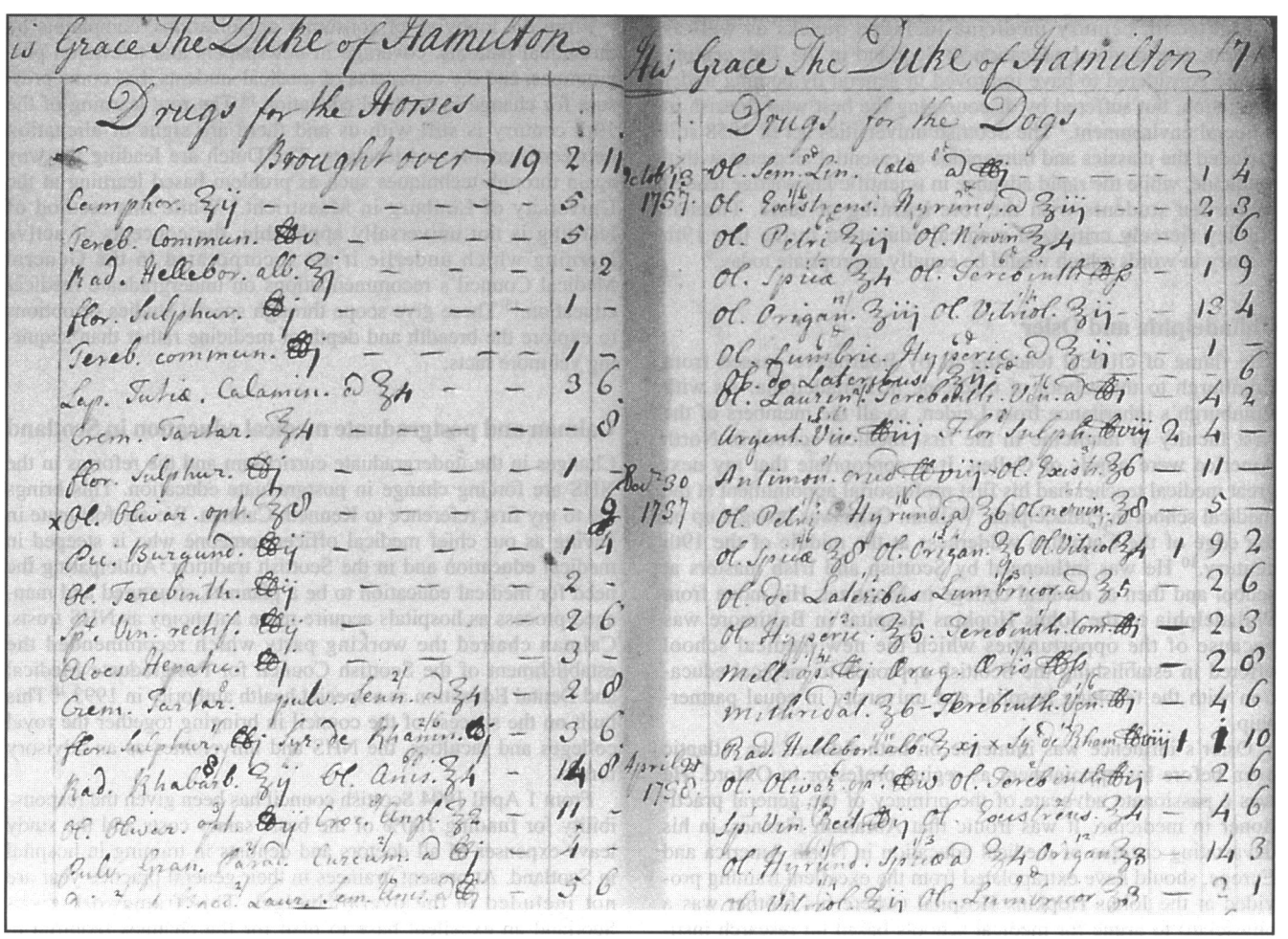

Figure 1. *William Cullen's account book when personal physician to the Duke of Hamilton and his household.*

18th century? There have been many theses written on the origins of the Scottish enlightenment and Edinburgh's golden age. The consensus view is that the Act of Union in 1707, with the consequent loss of the Scottish parliament and the exodus of the Scottish aristocracy to London, permitted intellectual liberalism, together with a recognition that previously competing groups needed to work together if Edinburgh was not to decline into a sleepy provincial backwater. The creation of the faculty of medicine in the Tounis College in 1725 is indicative of the new spirit of cooperation. In the previous century such a faculty was not possible owing to the opposition of the Royal College of Physicians of Edinburgh.

Cullen was a central figure within the Scottish enlightenment. Two of his close friends were David Hume and Adam Smith. In a sense Hume can be thought of as the originator of the double blind controlled trial in medicine. Through philosophical analysis he undermined in a fundamental way, previous ideas which linked association and causation. Through his scepticism he also laid the foundations for modernism — a cultural shift which also owed much to the work of Adam Smith. The selective application in the present reforms in the National Health Service of the ideas of Adam Smith indicate the power which ideas have across the centuries. What is sometimes forgotten is that Smith wrote that markets function through the self-interest rather than the benevolence of the butcher and baker.

While the roots of modernism can be discerned in the Scottish enlightenment, the golden age also saw the forerunner of postmodernism in Robert Burns. Through local idiom and inflection he continues to be magically able to speak to the whole world.

Eighteenth century medicine included quacks as well as Cullens, and medical education in Scotland in the 19th century can be considered to have improved in general by coming under regulation, but suffered by discouraging the best who flourish in a liberal environment.[5] The Scottish universities act of 1858 still included the classics and humanities as essential elements within medicine, while the rapid advance in scientific knowledge tended to burden students with the rote learning of facts. Thomas Huxley fiercely criticized medical education in the late 19th century in words which would be equally appropriate today.[9]

Philadelphia and Osler

The flame of clinical teaching lit by Boerhaave passed from Edinburgh to the school of medicine in Philadelphia. As with Edinburgh's inheritance from Leiden, so all the members of the first faculty of medicine in the first medical school in North America were pupils of Cullen. It is appropriate that my next great medical teacher had his first professorial appointment at the medical school in Philadelphia. William Osler was brought up on the edge of the Canadian wilderness at the middle of the 19th century.[10] He was influenced by Scottish and Irish masters at school and then at medical college in Montreal. His move from Philadelphia to the Johns Hopkins Hospital in Baltimore was because of the opportunities which the new medical school offered in establishing the Scottish approach to medical education with the teaching hospital and university in equal partnership.

Osler's influence was immense on both sides of the Atlantic even before his appointment as regius professor in Oxford. He was a passionate advocate of the primacy of the general practitioner in medicine. It was ironic that Abraham Flexner, in his devastating critique of medical education in North America and Europe, should have extrapolated from the excellent training provided at the Johns Hopkins Hospital (where his brother was a physician) to argue for medical schools based on research institutes with full-time researchers as the medical teachers. Flexner was dazzled by the spectacular advances in science and technology then flowing from the research institutes in Germany.[9,11] In opposing Flexner, Osler argued from the two pillars of science and the humanities for teaching to be in the hands of clinicians. He considered that the relevance of scientific enquiry in medicine is guaranteed if based on clinical observation and clinical responsibility while the value of scientific research emerges from a thorough grounding in the humanities which enables sickness and health to be understood in context.

Science and the humanities

Osler's last address in 1919 was as president of the British Classical Association and he chose as his title 'The old humanities and the new science', taking as his metaphor 'humanities are the hormones'. His thesis was that the humanities lubricate the intelligence of society in the same way as thyroxine enlivens and stimulates the body. He was arguing for the synthesis of science and the humanities because science was largely absent from higher education. Now it is medicine and the sciences which are insulated from the humanities.[12]

As at the end of the 19th century, medical education is under attack. The spectacular technological advances of the past 50 years have raised expectations about the ability of doctors to intervene successfully for all manner of illnesses and health problems. Failure is now associated with blame. With the expectation of technical excellence there is the continuing desire for doctors to be good communicators — the father figures and plumbers described by James McCormick.[13]

From the lobbying of consumer organizations, complaints by individual patients, coverage in newspapers and television programmes, and the comments of medical students, has come pressure for change in medical education.[14] The rote learning of the 19th century is still with us and there are signs of alienation between students and teachers. The Dutch are leading the way again through techniques such as problem based learning at the University of Limburg in Maastricht.[6] While this method of learning is not universally applicable, the concepts of active learning which underlie it are incorporated in the General Medical Council's recommendations on undergraduate medical education.[15] These give scope through special studies or options to explore the breadth and depth of medicine rather than acquiring yet more facts.

Calman and postgraduate medical education in Scotland

Changes in the undergraduate curriculum and the reforms in the NHS are forcing change in postgraduate education. This brings me to my first reference to Kenneth Calman. We are fortunate in having as our chief medical officer someone who is steeped in medical education and in the Scottish tradition. Anticipating the need for medical education to be a planned, structured and managed process as hospitals acquire more autonomy as NHS trusts, Calman chaired the working party which recommended the establishment of the Scottish Council for Postgraduate Medical and Dental Education as a special health authority in 1993.[16] This built on the success of the council in bringing together the royal colleges and faculties, the NHS and universities as an advisory forum.

From 1 April 1994 Scottish council has been given the responsibility for funding 100% of the basic salary costs and the study leave expenses of all doctors and dentists in training in hospital in Scotland. At present, trainees in their general practice year are not included in the overall budget. This framework gives Scotland an excellent base to plan for the changes required to implement the second Calman report on specialist training.[17]

Again, Maastricht is proving to be the driving force, this time as a synonym for the European Commission directive requiring countries to harmonize the training and certification of medical specialists.

With the new framework of undergraduate and postgraduate education what is the place of general practice? We may feel excluded from the processes relating to specialist training but I firmly believe that general practice is coming into its historical inheritance. Whatever one's views about the ethical basis of fundholding and its potential for delivering good care, the decision by the United Kingdom government to give general practitioners direct responsibility for ensuring good primary care and resources for commissioning secondary care is an indication of the confidence with which general practice and general practitioners are held.

Modernism

Culturally, I believe that the tide is in favour of general practice. I illustrate this by reference to my own experience. I grew up in a Yorkshire Pennine village 40 miles south of Aysgarth and passed each day on my way to school a drinking fountain in the village square (Figure 2). Erected by public subscription in memory of Dr Ramsden, the local country doctor who practised at the beginning of this century, the fountain is a symbol of the position general practitioners occupy close to the heart of the community. Coming from this background, I was surprised at medical school in Edinburgh amid the elegance, traditions and splendours of the Scottish capital to discover that my declared intention to become a general practitioner was seen as eccentric and lacking in ambition by my peers and teachers. Fortunately, an attachment as an undergraduate to Alastair Donald's practice demonstrated that general practitioners could be both relaxed in style and intellectually rigorous in their approach to clinical care.

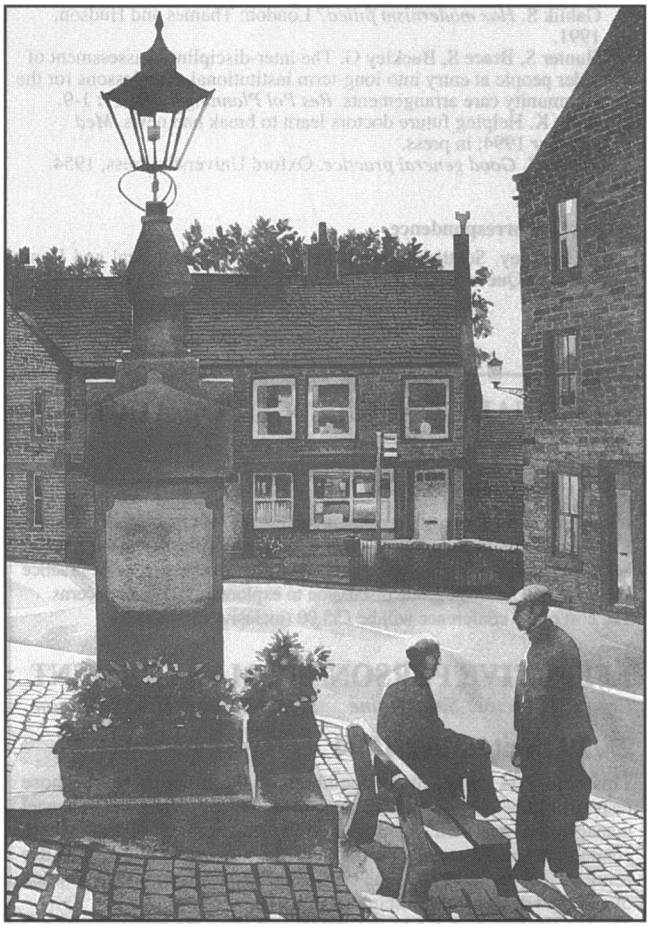

Figure 2. *Drinking fountain in Dobcross, erected in memory of Dr Ramsden.*

Why was the prevailing view of general practice in the 1960s so patronizing? My appointment as a general practitioner in Livingston provided some clues. The new town provided the opportunity for a previous chief medical officer in Scotland, John Brotherston, to create an experimental health service aimed at promoting integration between primary and secondary care with doctors holding conjoint appointments as general practitioners and specialists. This is not the occasion to expand on the history of the Livingston health care experiment. My reason to refer to Livingston is the concept of creating a new town which through its architecture is a concrete and visible expression of modernism.

Modernism, which I understand as a conscious break with the past, has its roots in the iconoclastic scepticism of David Hume and the undermining through science of the myth of man at the centre of the cosmos. Modernism is international in style and alienating in its effect. It is exemplified in architecture by tower block, in drama by the theatre of the absurd, and in art by abstract paintings.[18-20] Modernist music has been described as difficult to play, hard to listen to and impossible to whistle. The annexation of medicine by science to the exclusion of the humanities I interpret as modernist. Medical culture learned to distrust methods of analysis which are value based and contextually influenced. Comfort is taken in therapies and interventions which are apparently independent of context. It was this view of medicine which led to the disparagement of general practice in the 1950s and early 1960s.

Post-modernism

We are able to perceive the culture of other places and other times; our own culture is largely invisible to us. The visual arts may be the lens we need to view our present culture. Post-modernism in art and architecture shows itself to be eclectic, with conscious reference to historical roots and local context. Pluralism and variation are embraced as positive attributes, not as uncontrolled variables which need to be excluded. My own enthusiasm for the richness which this view of the world can bring is why I became a general practitioner and why my research has taken the direction it has.[21] Small scale qualitative studies can provide insights into the behaviour of individuals and organizations which are denied to larger scale studies. Critics have referred to these studies as belonging to social anthropology rather than medicine, which I take as a commendation.

It is the richness and variation of human existence which general practitioners can particularly contribute in medical education. The paraphrased response of Australian medical students when asked what they had learnt from their attachment to country doctors was 'how to live'. This approach to medical education may appear vague and diffuse but there are hard questions in medicine and specific dilemmas to be faced. I see post-modernism not as a kitsch or nostalgic movement but a recognition of the enduring values which encourage diversity and enrich our society.

If a focus is needed for the relevance of the humanities to medicine it is provided by medical ethics, not as a self contained extra to the main curriculum but part of the core. It can and should be addressed at all stages in undergraduate and postgraduate education. In a paper shortly to be published in *Medical Teacher*, Kenneth Boyd provides a useful framework when con-

sidering ethical questions: preparing; addressing; contextualizing; and applying.[22] In the early undergraduate years, medical students can prepare for tackling ethical problems by gaining an understanding of broad concepts such as confidentiality. At later stages, students address the clinical circumstances and contexts in which confidentiality may be in conflict with other ethical considerations. The precise contribution which general practitioners can give in the teaching of medical ethics and the humanities is in providing the personal community and organizational context in which ethical dilemmas have to be faced. The breadth and depth of general practice is demonstrated by a combination of science and the humanities in our education. Education is the transfer of values as well as knowledge from one generation to another. Values are born of sustained relationships. Within the new structured postgraduate's training there needs to be space and time for relationships between mentors and pupils to flourish.

Management

Science has been the dominant influence in medicine over the past 100 years. The consequent technological advances have created a health industry which consumes increasing proportions of national resources. The greatest challenge now facing doctors is to acquire the managerial skills necessary to provide the wide range of sophisticated services which patients are entitled to be offered while retaining the personal integrity which patients also deserve. Stephen Taylor stated this challenge eloquently in the epilogue to his book *Good general practice* in 1954:[23]

> 'The greatest danger faced by general practitioners is the risk to personal freedom and personal integrity which is liable to develop inside any large-scale organization. Organization is a means to an end. In the health service it is a way of bringing together those who are sick and those trained to help them. Organization must not be belittled; but it must not be exalted for its own sake, for that is the way to tyranny. The price of liberty is eternal vigilance, and the vigilance must be all the sharper because some tyrants have the best possible intentions.'

Mentors and country doctors

General practitioners have many duties and responsibilities to fulfil. From our roots in the 18th century as physicians, surgeons, apothecaries and male midwives we can claim to have become central figures in the NHS as clinicians and managers. The breadth and depth of general practice has been the theme of the spring symposium. This requires not only the combination of science and humanities in our education, it also needs the values which come from the continuing relationships between doctors and patients and between teachers and pupils.

Alastair Donald has shown, in the tradition of William Pickles, by his work with a generation of young doctors the value of mentors in medical education. It is a privilege and a pleasure for me to be able to acknowledge my personal debt to him as my medical mentor and also record my debt to his co-trainer and college examiner, Constance Gibbs who sadly died soon after retiring from practice, and to John Howie. They have shown me that it is possible even in an inner city practice to be a 'country doctor' by the influence they have had on a whole community.

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