Medical Education and Medical Care

A Scottish-American Symposium

Arranged by the Nuffield Provincial Hospitals Trust
and the Josiah Macy Jr Foundation to commemorate
the 250th Anniversary of the founding of the
University of Edinburgh Medical School
and the Bicentennial of the Declaration of Independence
and founding of the United States of America

Papers by Alexander Bearn, John Z. Bowers
Sir John Brotherston, Jack Cole, George Forwell
Ronald Girdwood, Donald McIntosh, Gordon McLachlan
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Preface

BY SIR EDGAR WILLIAMS, CB, CBE, DSO, DL
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The Bicentenary of the United States and the 250th anniversary of the Edinburgh Medical School in 1976 provided apt opportunity and agreeable excuse for two foundations, one American, one British, each concerned with the quality of medical care, to join together once again in a symposium[1] to compare notes and contrast results in their respective countries. The Josiah Macy Jr Foundation and the Nuffield Provincial Hospitals Trust, through the kindness of the Edinburgh Medical School, were enabled to invite interested individuals from both sides of the Atlantic to come together to consider *Medical Education and Medical Care*. This publication embodies a summary of the papers and discussions which were enjoyed in Edinburgh at the end of September 1976 in the hope that those who could not be with us may also gain from our deliberations.

BY JOHN Z. BOWERS, MD
President, Josiah Macy Jr Foundation

It may seem strange that the initial steps towards a symposium to honour the 250th anniversary of the University of Edinburgh and the Bicentenary of the United States were taken in Vancouver, British

1. See McLachlan, G., and McKeown, T. (eds), *Medical History and Medical Care* (Oxford University Press for the Nuffield Provincial Hospitals Trust, 1971).

Columbia. When Sir John Brotherston and I were speakers at the 25th anniversary of the Faculty of Medicine of the University of British Columbia in June 1975, we agreed that a symposium should be held in Edinburgh in 1976 to commemorate our respective festive occasions. Happily, the Nuffield Provincial Hospitals Trust, inspired by its secretary, Gordon McLachlan, himself an ardent Edinburgh alumnus, volunteered to join forces. The first Nuffield–Macy symposium was held in October 1970, and a most rewarding alliance was thereupon established; the *entente cordiale* became active for a second time at Edinburgh in September 1976.

For the American delegation, which included two distinguished transplanted British scholars, the opportunity to learn about health services and their interactions with medical education was especially timely: the Congress of the United States enacted legislation in 1976 placing our medical schools and programmes in postgraduate medical education under broader federal controls than at any time in our nation's history.

To assure that the brilliant papers and illuminating discussions of the British and American participants reach the widest possible audience, the Macy Foundation will distribute the report of the symposium to the libraries of the schools of medicine and public health in Canada and the United States.

The Scottish–American conference, which is reported here, demonstrates the value of more regular discussions between leaders in medicine and health from Britain and the United States. Fortunately, we are not required to defer these for another milestone in the history of a great university and of the United States, and such plans are already afoot to carry on the dialogue.

The Macy Foundation always enjoys an opportunity to work with its friends at the Nuffield Provincial Hospitals Trust.

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The influence of Edinburgh on American medicine

JOHN Z. BOWERS

The influence of Edinburgh on American medicine

The Faculty of Medicine of the University of Edinburgh is the mother of American medicine. To it we owe the first medical schools in the American colonies and the genesis of our medical profession. The publications of Edinburgh professors were the earliest standard medical texts to be printed in the United States, and *The Edinburgh Pharmacopoeia* was the progenitor of the American formulary.

Scottish immigration

The characterization of America as the 'melting pot' began in the colonial era. As one early immigrant wrote:

> I could point out to you a family whose grandfather was an Englishman, whose wife was Dutch, whose son married a Frenchwoman, and whose present sons have now four wives of different nations. He is an American who, leaving behind all his ancient prejudices and manners, now receives ones from the new mode of life he has embraced, the new government he obeys (1).

The immigration of native Scots and Scots-Irish from the Great Plantation in Ulster, which began as a trickle in the seventeenth century, mounted to several major waves between 1717 and 1775. The largest number came from Ulster, driven away by recurrent famines, high land rents, and other sources of economic hardship: during the eighteenth century there was an influx of about 200,000 Scots-Irish from Ulster. The large-scale movement of native Scots did not begin until 1763–5, when some 25,000 emigrated for a better life in the New World, career opportunities, and an outlet for their missionary zeal.

Scots-Irish and Scots constituted a higher percentage of the colonial population than was formerly believed. A study of the first federal census of 1790 shows that of the total white population, 60·9 per cent were English; 14·3 per cent Scots-Irish and Scottish; 8·7 per cent German; 5·8 per cent Dutch, French, or Swedish; 3·7 per cent southern Irish; and 6·6 per cent unassignable and miscellaneous.

The early Scots-Irish immigrants attempted to settle in New England, but found the close-knit communities with their strong Congregational orientation inhospitable: Congregationalism was practically the state religion of New England. In contrast to the plantation-style life of the southern colonies, with a single staple crop such as cotton from which the owner could amass a fortune, the economy of New England was based on intensive cultivation of small plots and an abundance of fish. Opportunities for acquiring cultivable land in the rocky New England terrain were limited, and the climate was demanding. The bulk of the Scots-Irish and Scots therefore turned to the Middle Atlantic and Southern states: from New Jersey to the Carolinas.

Scottish and Scots-Irish physicians in the colonies

Native Scottish and Scots-Irish physicians first established themselves in the colonies before 1750; most of them had received a Scottish university education. They were scattered throughout the colonies from Massachusetts to New York, Pennsylvania, and Maryland; and from Virginia to South Carolina. Their contributions took several directions:

> First, they were instrumental in helping to form the beginnings of an intercolonial community of intellectuals.... Second, the academic background of these Scottish physicians set them apart from most of their fellow American scientists.... Finally, these physician-scientists consciously maintained their identity as Scotsmen (2, pp. 228–30).

They were described in the *American Medical and Philosophical Register* late in the eighteenth century as having 'done much for the advancement of medical and physical sciences on this side of the Atlantic' (3). As early as 1728 one of them, Cadwallader Colden (1688–1766) of New York, one of the most learned men in the colonies, wrote to William Douglass, practising in Boston, urging the

establishment of a colonial scientific society; this instigated the establishment of a short-lived medical society in Boston eight years later.

As devoted alumni of Edinburgh, they kept in close touch with their *alma mater*, and, as Edinburgh alumni have done in many lands through the centuries, they were a major influence in encouraging young Americans to go there for the study of medicine.

Scottish education in the colonies

The broad influence of Scottish philosophy and literature in America before the Revolution was rather casual. It was largely explicable in terms of the influence of 'particular ideas of particular writers on particular men or institutions' (4). On the other hand, the Scots-Irish and Scots included a number of Presbyterian ministers who were usually graduates of Scottish universities and who carried with them the admirable Presbyterian tradition of concern for education. This concern found expression in the establishment of academies that were not devoted exclusively to education for the ministry, but accepted young men preparing for a variety of careers, including medicine. The academies were predominantly college preparatory, or, occasionally, college-level institutions, ranging from high-quality grammar schools to a significant number that were granted college charters. One of the first academies was established at Little Neshaminy Creek, twenty miles north of Philadelphia, as early as 1727 by the Revd William Tennent, a 1695 Edinburgh graduate. It was a breeding ground for ministers of the revivalist 'New Side', or the 'New Light', who were opposed to strict conformity to the Westminster Confession and its doctrinal formulations, which were absolutely binding upon its adherents.

The leading preparatory school for future medical students at Edinburgh was the Nottingham Academy on the Maryland–Pennsylvania border, founded in the early 1740s by Samuel Finley (1715–76), a Presbyterian minister of Scots-Irish lineage. A student entered Nottingham at the age of 7, and studied Latin and Greek, the classics, logic, arithmetic, geography, some geometry, and history. In his autobiography, Benjamin Rush (1745–1813), the most renowned American to study at Edinburgh, described the teaching of the sciences at the academy as being done 'in a more cursory manner' (2, p. 62).

Finley was also a leader of the New Side, and in 1761 he became president of its educational capital, the College of New Jersey, founded in 1746.[1] The college took a decisive step forward in 1768 when a Presbyterian minister from Edinburgh, the Revd John Witherspoon (1723–94) assumed the presidency. He had at first declined the offer, but was persuaded by Rush, then a student at Edinburgh, to reverse his decision.

Witherspoon is described as representing an unusual species for his era; an intelligent and literate scholar, yet a strict Presbyterian whose knowledge isolated him from straitlaced Presbyterians, and his religion from proper clerical circles in Edinburgh. The college was at the peak of its dedication to the New Side, and Witherspoon was able to remodel the curriculum along Edinburgh lines, with instruction in criticism and philosophy based on 'common sense' philosophy, which Witherspoon often expressed as 'common utility' or 'experience'. In the words of Sloan, Witherspoon

> ... introduced his students to some of the most important ideas of the eighteenth century ... At a time when the minds of his countrymen were fixed on political concerns, he brought before them his staunch conviction that the ultimate success of the political venture rested in the beneficent influence of religion and education ... he shifted the church's mission away from revivalism and toward education (2, pp. 144–5).

Although he originally believed that the clergy should not dabble in politics, Witherspoon accepted an appointment to the Continental Congress and was a signatory of the Declaration of Independence.

From Rush we have an outline of the Edinburgh-style curriculum offered a student preparing for the study of medicine at the College of New Jersey. As a freshman student at the age of 13, Rush read Xenophon and Cicero, studied Hebrew grammar, Watt's logic, and some rhetoric, geography, and astronomy. In the sophomore year, the classics continued, and Rush delved further into natural philosophy; a special emphasis was placed on astronomy, and there was an 'electrical machine' and an orrery (a mechanical model of the solar system). Natural philosophy continued in the third year, when Rush began the study of moral philosophy and ethics. The senior year was devoted primarily to a review of the previous years.

In passing we should note that the emphasis on the classics, Latin and Greek, as at the College of New Jersey, dominated the American

1. The college moved from Newark, New Jersey, to Princeton in 1756, and although it was frequently referred to as Princeton, that name did not become official until 1896.

college curriculum until the last quarter of the nineteenth century. Science had been taught at Harvard as early as the seventeenth century, but in a decidedly limited manner. In an address on 14 June 1867, James S. Garfield (1831–81), a future president of the United States, described a typical curriculum: 'In the whole program of study, lectures included, no mention whatever is made of physical geography, or anatomy, physiology, or the general history of the United States' (5). At Harvard, at that time, four-sevenths of the curriculum was exclusively concerned with Rome and Greece. Further, until the last quarter of the nineteenth century, the American curriculum was completely rigid; there was no opportunity for a student to elect courses that would best suit him for his chosen career. The emphasis on the classics and the lack of electives was a major barrier for American students interested in the study of medicine.

The College of Philadelphia, founded as an academy in 1749 and converted to a college in 1755, was another spawning ground for future physicians that was heavily influenced by Edinburgh. In 1756 its first provost, the Revd William Smith, an Aberdonian, proposed a curriculum for an imaginary, Utopian, College of Mirania, modelled in part on the Aberdeen curriculum: mathematics, botany, natural history, and chemistry, based on Herman Boerhaave. Francis Alison, who was born in Ulster and educated in theology at Edinburgh, became the head of the Philadelphia Academy in 1752. Benjamin Franklin 'the first civilized American' was the leading patron of the academy and a strong advocate of Alison's philosophy, which emphasized the importance of science as well as religion.

The third colonial college to benefit from the Scottish influence was the Anglican College of William and Mary, which had been founded in Williamsburg, Virginia, in 1701. William Small, a Glasgow graduate and former medical student, was appointed Professor of Natural Philosophy in 1758 and he introduced aspects of the Scottish curriculum.

Following their college education, future physicians, especially those from Philadelphia, often served three or more years of apprenticeship to a medical preceptor. The most popular colonial preceptor was John Redman of Philadelphia (1722–1808). Redman was one of the first generation of Americans to study at Edinburgh, arriving there in October 1746; one year later he went to Leyden, where he was awarded the medical degree in 1748.

On his return to Philadelphia, Redman limited his apprentices to two, and they were totally, if not gainfully, employed. Rush spent five and a half years with Redman, and during that period was absent from his work for just eleven days. When Redman was out of town or ill, Rush and his fellow apprentice assumed full responsibility for the practice. They were required to abridge Gerhard Van Swieten's *Commentaries* and to study the writings of Redman's principal guides, Thomas Sydenham and Boerhaave; they were also allowed to read Redman's manuscript notes of lectures he had attended in Edinburgh. Redman encouraged them to keep a daily workbook in which they were to record any new information they acquired. Not all apprentices spent five and a half years, as Rush did, but the minimum period was about three years.

A number of Americans served preceptorships with physicians in Edinburgh before enrolling in the Faculty of Medicine.

American students at Edinburgh

The strength of the Presbyterian church, its academies, and its College of New Jersey were among the factors that encouraged Americans to travel to Edinburgh. The colonists also admired and were influenced by Scotland's commanding position in higher education. Intellectual leaders of a range of denominations were beginning to seek some avenue by which the benefits of the eighteenth-century Enlightenment might be introduced to America without committing heresy or weakening the total clerical dominance of American educational institutions. They were especially impressed with the fact that the Scottish universities were benefiting from the Enlightenment without severing their ties with the Church.

Perhaps the Americans recognized that their society was basically similar in terms of its cultural needs to that which had characterized Scotland before the Enlightenment. Just as the literati of Scotland had viewed themselves as provincials when they encountered the urbane culture of London's drawing rooms, men concerned with the life of the mind in Philadelphia, Boston, and New York probably had a similar reaction. Thus they admired the Scots for their unique success in creating a culture that was both national and cosmopolitan; they yearned for a comparable development in America.

The opportunity to earn a medical degree, which was not available in London, was another factor that drew Americans to

Edinburgh. The final lure was the preeminence of the Faculty of Medicine.

John Moultrie, a member of a renowned South Carolina family, was probably the first American to receive the Edinburgh medical degree: he was awarded his diploma in 1749. Edinburgh soon became the 'only' medical school for Americans. Thus, of the thirteen graduates of Edinburgh in 1765, five were Scots, five were Americans, two were English, and one was Irish. One hundred and seventeen Americans earned their medical degrees there between 1747 and 1800, and almost twice as many studied there for one or more years. From Virginia alone, in three decades, 1760–90, twenty-seven physicians received Edinburgh degrees and twenty others studied there without earning a diploma.

The leading students come from Quaker Philadelphia, the intellectual and cultural centre of America until the Civil War. Some of them first studied in London, where until 1775 John Fothergill (1712–80), a 1736 Edinburgh medical graduate, and Benjamin Franklin (1706–90) served as their 'dean' and 'advisor'. Franklin was an Edinburgh advocate, as was, of course, Fothergill, a devout Quaker and London's leading physician. Although Fothergill had never visited the colonies, his father and brother had, and they had fostered his interest in American Quakers. He continued to work with Franklin for a peaceful solution of the American problem until the outbreak of hostilities. In this endeavour, Fothergill's hand was strengthened through his role as personal physician to Lord Dartmouth, Secretary of State.

One purpose of the students' spending a period of time in London was to study anatomy with John (1728–93) and William (1718–83) Hunter. A second was to walk the wards of the London hospitals, of which Guy's was undoubtedly the most popular. The London educational experience was desirable because the very large number of students at Edinburgh and the emphasis on the lecture and theory limited the opportunities for practical bedside teaching, which was readily available in London.

Rush was the most renowned American to graduate from Edinburgh, and his accounts give the best picture of the life of an American student, bearing in mind that, with his protean interests and ideas, Rush was an outstanding young man in any circle. Carrying letters of introduction to Edinburgh's intellectual and social circles, a few weeks after his arrival Rush became acquainted with David

Hume (1711–76), the renowned philosopher and historian, and with William Robertson (1721–93), principal of the university and author of the respected *History of Scotland During the Reigns of Queen Mary and King James VI* (1759) and *The History of the Reign of Charles V* (1796). Thomas Blacklock and Dugald Buchanan, well-known Edinburgh poets, were among Rush's close acquaintances; he dined at the home of Sir Alexander Dick, to whom he bore a special letter of introduction from Franklin; and he was admitted as a burgess and guild brother of the city. Rush broadened his ties to Edinburgh by becoming a close friend of Lady Jane Belcher, daughter of the Earl of Leven, a principal leader of the Church of Scotland.

For Philadelphians such as Rush, the continuity of their Quaker bonds was assured by the Edinburgh Friends, who took them to religious meetings and cared for their health and welfare. The two groups were a study in contrasts. Jonathan Potts, a student from Philadelphia, preferred the silent devotions of the Edinburgh Friends to the more talkative Philadelphia co-religionists:

> . . . there is more Life & heartfelt Religion in the silent Meetings at Edinburg [*sic*] than in the Meetings of the highly-favored People at Phil. who have line upon line, & precept upon precept, & who perhaps overlook that indwelling Word which is not only able to direct Men to the path of Life, but will enable them to walk in it. . . . (6, p. 53).

Rush had two heroes on the Edinburgh faculty. The first, William Cullen (1710–90), Professor of Chemistry, Materia Medica, and the Practice of Physic, he described as:

> *Dr. Cullen*, the great the unrivalled *Dr. Cullen* is going on unfolding each Day some new facet to us in the Animal Oeconomy . . . I think I would not fail of having heard them [his lectures] for ten thousand pounds. Illustrious Oracle of human Wisdom live—live forever! (6, pp. 53–54).

As Bell points out:

> . . . less than twenty years later another Philadelphian described Cullen as 'certainly one of the greatest men that ever lived—his method in arrangement & his perspicuity in argument are astonishingly fine & convincing—like a true philosopher he makes every thing tend to the illustration of his subject' (6, p. 54).

The fact that Cullen lectured in English instead of Latin impressed Rush, as it did other Americans. Cullen was the epitome of

the teacher and scientist for Rush, and in his *Eulogium* for Cullen in 1790 Rush reminded his Philadelphia colleagues of this:

> You will recollect with me how agreeably he accommodated himself to our different capacities and tempers; how kindly he dissipated our youthful blushes, by inviting us to ask him questions; and how much he taught us, by his inquiries, of the nature of the soil, climate, products and diseases even of our own country ... the art of teaching others ... the benefits of his discoveries to every part of the United States (7).

Cullen had an equally high opinion of his American students. Resuming their correspondence after the revolutionary war, he wrote to Rush:

> I hold you and shall always hold you in the same esteem and affection as ever ... [and sent his] respectful and affectionate compliments to all my old pupils at Philadelphia. I shall always hold it my highest honour that the founders of the Medical College of Philadelphia were all of them my Pupils and if it can be known I think it will be the most certain means of transmitting my name to a distant posterity for I believe that this School will one day or other be the greatest in the world (6, p. 59).

Having been advised that he should prepare himself to teach chemistry in the new medical school in Philadelphia, Rush attended the chemistry lectures of his other hero, Joseph Black (1728–99). He was so impressed with Black that he vowed he would be doing Black a great dishonour if, after listening to his lectures, he attended any other chemistry lecture in the British Isles.

Rush left Edinburgh in September 1768 to walk the wards in London, to dissect with William Hunter, to dine with Samuel Johnson, to become an acquaintance of Fothergill, and to visit John Wilkes in prison. Johnson was to comment a few years later: 'Sir, I am willing to love all mankind except an American' (8). In the summer of 1800 Rush wrote: 'The two years I spent in Edinburgh I consider as the most important in their influence upon my character and conduct of any period of my life' (2, p. 194).

Rush was a man of amazing versatility and vast resources of energy: he conducted 'a one-man crusade to remake America (2, p. 196). A universalist in his belief that all men could be saved, he was Philadelphia's leading practitioner of medicine, of social reform, and of educational reform from elementary school to university. At the same time, he held professorships in our first medical school in, successively, chemistry, theory and practice of medicine, institutes

of medicine, and the practice of physic. Rush was the only important systematic writer on medical subjects in America in the eighteenth century. As the first American physician to consider diseases of the mind, he is a legendary hero to American psychiatrists. A leader in the Revolution and a signatory of the Declaration of Independence, Rush was regarded with the highest esteem by the other revolutionary leaders. At Rush's death in 1813 Thomas Jefferson, third president of the United States, wrote to the man whom he had succeeded, John Adams:

> Another of our friends of '76 is gone, my dear Sir, another of the co-signers of the independence of our country. And a better, than Rush, could not have left us more benevolent, more learned, of finer genius, or more honest (9).

Edinburgh and America's first medical school

Three Philadelphians who studied medicine at Edinburgh and an English Edinburgh graduate practising in London were the principal actors in the establishment of America's first medical school. The Americans were, in the order of their graduation, William Shippen (1726–1808), John Morgan (1735–1809), and Rush; the Englishman was Fothergill.

Shippen, a graduate of the College of New Jersey, had studied dissection with the Hunters, and had walked the wards of the London hospitals before enrolling at Edinburgh, where he was awarded the medical degree in 1761. During his months in London Shippen discussed with Fothergill the desirability of initiating lectures in anatomy on his return to Philadelphia. He held further discussions on the question of a fully-fledged medical school with Morgan after the latter arrived in London in May 1760, and they agreed that the school should be modelled after Edinburgh, with a university-type faculty, rather than after the pattern of the practitioner-oriented London hospital schools.

Fothergill was an ardent champion of the establishment of a medical school in Philadelphia, and on 4 July 1762 addressed a letter to one James Pemberton in that city in which he stated that Morgan and Shippen, if given proper legislative support, would be able to develop a medical school that would draw students from the colonies and from the West Indies. On his return to Philadelphia in 1762 Shippen opened a private school of anatomy where the bodies of

executed criminals and suicides were used for dissection. In January 1765 he added lectures on midwifery to train obstetricians and midwives.

Endowed with singular charm as well as intellectual talents, Morgan was a young lion of both academic and social circles in Edinburgh. After receiving his degree in 1763, he took the 'grand tour' in the elitist style: he travelled to Italy in the suite of the Duke of York, had a special personal audience with the Pope, and accepted the hospitality of Voltaire at Ferney in Switzerland. When Morgan and his friends were saying their farewells to Voltaire and his court, they received a typical salutation from the renowned scholar:

> Behold two Amiable Young Men, Lovers of Truth & Inquirers into Nature. They are not satisfy'd with mear Appearances, they love Investigation & Truth & despize Superstition—I commend you Gentlemen—go on, love Truth & search diligently after it. Hate Hyprocisy Hate Masses & above all Hate the Priests (6, pp. 68–69).

Morgan's plans for a medical school crystallized by the spring of 1763, and he divulged them in London to Thomas Penn, Proprietor of Pennsylvania, who endorsed them. By now, Morgan had determined that the new school should be under his exclusive direction and not shared with Shippen. The latter actually knew nothing about Morgan's plans, and this was to be a source of bitter acrimony between them—an acrimony that blighted the careers of both men. Before returning to Philadelphia in April 1765, Morgan was elected to fellowships of the Royal Colleges of Physicians in London and in Edinburgh; while he was crossing the Atlantic he was elected a Fellow of the Royal Society. These unusual honours for a man just 30 years old are attributable not only to Morgan's brilliance but to the host of influential friends he had cultivated in the two capital cities.

In May 1765 Morgan's plans for a medical school were presented to the trustees of the College of Philadelphia with a letter of endorsement from Thomas Penn (10). The trustees appointed Morgan Professor of Theory and Practice of Physic, thereby signalling their adoption of the proposal for the beginning of academic medical education in America.

At the commencement exercises of the College of Philadelphia on 1 June 1765 Morgan placed his proposals on the public record; they carried the strong imprint of his months at Edinburgh. His

curriculum called for students to enter the study of medicine with a sound background in science, mathematics, and literature, and the ability to read Latin and Greek; the preclinical years should include chemistry and physics, followed by anatomy and physiology; instruction should be given by qualified professors; the new school should have close relations with a teaching hospital, and include an adequate library. Morgan placed special emphasis on the medical faculty as an essential part of a university. Finally he proposed that students should have an opportunity for a period of study in Britain and Europe.

Shippen joined Morgan reluctantly at the College of Philadelphia and together they taught the full range of courses: anatomy, chemistry, materia medica, medicine, surgery, and midwifery.

Rush returned from Edinburgh in 1769 to teach chemistry, carrying a strong letter of endorsement from Fothergill. Adam Kuhn (1741–1817), Professor of Botany and Materia Medica, had studied botany at Uppsala with Linnaeus. He then studied medicine in London, and finally went to Edinburgh, where he received the medical degree in 1767. One of his students at Philadelphia, however, commented that Kuhn's lectures were little more than a digest of Cullen's lectures. So it was that the four founding fathers of American medical education were Edinburgh graduates.

The medical college closed in 1774 when Morgan became Medical Director (Surgeon-General) of the Continental Army. Shippen succeeded Morgan in that post after the latter was dismissed for incompetence by the Congress in January 1777. He attributed his problems to Shippen, who, he maintained, had intrigued against him. Although Morgan was vindicated in 1779, he retired into partial seclusion and made no effort to resume the teaching of medicine. After such a meteoric career, characterized by a series of brilliant successes, the humiliation that terminated his army career left Morgan a broken man. He died in poverty in 1809.

We should not leave Philadelphia without recognizing another Edinburgh graduate, Caspar Wistar (1761–1818), who during his student days was elected president of the Royal Medical Society; he graduated in 1786. On his return to Philadelphia, Wistar taught chemistry and anatomy at the medical college. In 1811 his *A System of Anatomy* was published as the first American text on that subject. His name is permanently enshrined in botanical circles by the beautiful wisteria plant, which was named for him by the Abbé

Correa da Serra. In anatomical and biological circles his memorial is the Wistar Institute of Anatomy and Biology in Philadelphia, created in 1892 by Wistar's great-nephew, Isaac John Wistar (1827–1905).

The design of Edinburgh's Royal Infirmary probably influenced the architecture of the Pennsylvania Hospital, which was chartered in 1751 and opened in 1752 as the first institution in colonial America designed as a general hospital.

David Hosack and New York

David Hosack (1769–1835) was a man of good mind, sound body, and standards of conduct and achievement that were characteristic of his Scottish lineage. After graduating from the College of New Jersey in 1789, Hosack studied medicine at the Medical School of the University of Pennsylvania for two years, and graduated in 1791. Influenced by two Edinburgh graduates, Rush and Wistar, as well as by his Scottish lineage, Hosack went to Edinburgh for nine months to further his medical education.

His latent interest in botany is said to have been brought to the surface through his strolls in the gardens of Dr Alexander Hamilton at Blandford. Hosack's months at Edinburgh naturally included a pilgrimage to the estate in Elgin, Morayshire, where his father had been born.

During a clinical year in London at St Bartholomew's and St George's Hospital medical schools, Hosack furthered his botanical interests by studying at the Linnaean Herbarium and by becoming a member of the Linnean Society. He returned to New York from London with what was essentially a portable herbarium, and was appointed Professor of Materia Medica on the medical faculty of Columbia College. Hosack joined another Edinburgh graduate, Samuel Bard (1742–1821), in the practice of medicine and surgery, and soon became one of New York's leading physicians and surgeons. He was a founder of Bellevue Hospital, which was probably America's first public hospital.

Hosack's botanical interests were undiminished, however, and in 1801 he established the Elgin Botanic Garden. The purchase price —for a plot of twenty acres, three and a half miles north of the populous centre of the city—was $4,807·36, plus a yearly rent of 16 bushels of merchantable grain or its equivalent in money. The

garden included a number of specimens given to Hosack by Sir James Edward Smith of the Linnean Society, and it was the only broad botanical collection in the New World in that period. Students came to the garden to study botany with Hosack, and he also used it for demonstrations in his course in materia medica for medical students. But the cost of maintaining the garden soon became excessive, and by 1808 Hosack found it necessary to request the New York legislature to purchase the property. The sale was consummated in October 1810 for the sum of $72,268·75, and the following year the legislature assigned the garden to the College of Physicians and Surgeons of Columbia.

The island of Manhattan's burgeoning growth was necessarily northward, and the Elgin Garden was situated in the area that today lies between Fifth and Sixth Avenues and Forty-Eighth and Fifty-First Streets. The land was leased by John D. Rockefeller Jr in 1931, and the final rivet for Rockefeller Center, on the former site of Hosack's garden, was driven by Rockefeller on 1 November 1939. Two mementoes of David Hosack now adorn the Center: the botanical specimens that crown the central mall, which are changed periodically to coincide with the seasons; and a plaque that reads:

In memory of David Hosack, 1769–1835, Botanist, Physician, Man of Science and Citizen of the World. On This Site He Developed the Famous Elgin Botanic Garden, 1801–1811, For the Advancement of Medical Research and the Knowledge of Plants.

The annual rent was recently renegotiated at approximately $8 million.

Hosack's scientific enthusiasm acquired at Edinburgh was indirectly the means by which Columbia University and its faculty of medicine became one of America's, and indeed the world's, leading institutions of higher learning.

The Medical School of King's College, New York

America's second medical school founded just two years after the school in Philadelphia, was also modelled after Edinburgh. Samuel Bard, as a medical student at Edinburgh, wrote to his father, John Bard (1716–99), an eminent New York surgeon, about the desirability of establishing a medical school on his return. He expressed envy

that Morgan and Shippen would be the first to teach medicine in a systematic manner in his native land.

The organization of a medical school in New York was more difficult than it had been in Philadelphia because there was no suitable hospital for clinical instruction. John Jay, a 1763 graduate of Edinburgh, had made the first proposals for a New York school, but the real impetus came from Bard, when he returned from Edinburgh. In 1767 the trustees of the Anglican King's College, founded in 1754 under a grant from King George II, invited six leading physicians and surgeons in New York to accept professorships of a new medical faculty. Bard became Professor of the Theory and Practice of Physic, and a Scot, Peter Middleton (d. 1781), Professor of Physiology and Pathology. Middleton, with John Bard, performed one of the first autopsies, with injection of the vessels, in America.

King's College Medical School was closed during the revolutionary war; in 1784, under the supervision of the Regents of the University of the State of New York, it was reopened as Columbia College, under the leadership of Hosack, Samuel L. Mitchell (1764–1831), and Nicholas Romayne (1756–1817), medical graduates of Edinburgh in 1786 and 1779, respectively.

Romayne left Columbia in 1807 to establish an independent College of Physicians and Surgeons of New York City, to which he attracted other Edinburgh graduates, including Hosack. The medical faculty of Columbia was merged with the College of Physicians and Surgeons in 1814.

The New York Almshouse and Bridewell, a debtor's prison, became the centres for clinical teaching, and in 1826 Hosack described the Edinburgh pattern that was followed in these two institutions:

> The sick were visited at a stated hour, their cases were regularly recorded, and the prescriptions from day to day entered in a book left for the purpose by the attending clerk in the manner pursued in the infirmary of Edinburgh. The cases were afterwards made the subject of clinical lectures, delivered by the physicians in attendance (11).

Rendall noted in a lecture in Edinburgh in 1976 that very few medical students at Edinburgh came from New England (12). This is attributed to different patterns of emigration, educational traditions, and a lessened emphasis on medical training in that region.

One New Englander who studied at Edinburgh was Benjamin Waterhouse (1754–1846), a relative of Fothergill. Waterhouse was

one of the few Americans studying in Edinburgh during the revolutionary war, and he experienced the anguish of the loyal American in a British city:

> On the news of some American disaster Edinburgh was illuminated, I shut myself up in my room with no lights in my window and suffered only a few illiberal sarcasms by the passing mob. Nothing was talked of but inflicting exemplary punishment on the rebels; the inveteracy of the Scotch soldiery towards us rebels was manifest throughout the revolutionary war (13).

On his return to Massachusetts, Waterhouse became the first Professor of Physic at the new Harvard Medical School.

Edinburgh and the medical profession

The Edinburgh influence was not restricted to medical education. The leading American medical practitioners in New York, Pennsylvania, South Carolina, Maryland, and Virginia were men who had studied at Edinburgh. Ephraim MacDowell (1771–1830), who was at Edinburgh in 1792–4, returned to practise in Danville, a frontier Virginia town. He successfully removed an ovarian tumour under primitive conditions, without anaesthesia or antisepsis, while his patient sang hymns and the villagers clustered outside his office awaiting the results: this marked the beginning of abdominal surgery in America.

William Charles Wells (1757–1817) of Charleston, South Carolina, the intellectual capital of the South until the Civil War, received the Edinburgh medical degree in 1780. One of the handful of early American physicians with genuine scientific inclinations and abilities, Wells was perhaps the first to define the relationship between the appearance of albumin in the urine and dropsy. He is best known for his *Essay on Dew*, in which he propounded his theory of dew and dewpoint (14). In addition, Wells probably gave the first account of the relationship between rheumatic fever and heart disease. Unfortunately, as a loyalist, he found Charleston inhospitable during the Revolution, so he moved to London where he carried out his studies on rheumatic fever at St Thomas's Hospital.

The high Edinburgh standards adopted by Morgan were soon lost in the national shift in objectives from survival to expansion. Intense competitiveness based on ruthless individual enterprise became the hallmark of the expanding frontier. With the Age of Jackson (1829–

37) the emphasis moved to an egalitarianism that derided cultivation of the mind as elitist. The medical schools adopted the following characteristics: no admissions standards and no requirement for pre-medical studies; teaching by practitioners solely concerned with sharing funds from student fees; a two-year teaching programme in which the first year's courses were repeated in the second year; evaluation solely on the basis of oral examinations; and an active disdain for anything that smacked of a university relationship. In 1869, when Harvard's president, Charles W. Eliot, proposed written examinations, Henry J. Bigelow (1818–90), Professor of Surgery at Harvard, told him '... he knew nothing about the quality of Harvard medical students: more than half of them can barely write. Of course they can't pass written examinations' (15).

The Edinburgh Pharmacopoeia

The Edinburgh Pharmacopoeia was the 'progenitor of American pharmacopoeias' (16). First published in 1699, it went through more than fifteen editions from 1753 to 1841, with fifty printings in six languages. It was the primary source for the first American compendium, *The Lititz Pharmacopoeia* of 1778, named after the Moravian village in Pennsylvania where it was assembled. Its compiler, William Brown (1748–92), was born in Virginia and graduated from Edinburgh in 1770. The Massachusetts Medical Society's *Boston Pharmacopoeia*, published in 1808, was almost a facsimile of the Edinburgh publication, and it, in turn, served in a similar role for the first *Pharmacopoeia of the United States*, published in 1820.

The New Edinburgh Dispensatory was first published in Philadelphia by Thomas Dobson in 1791; in 1796 the same house published *The Edinburgh New Dispensary—The Fourth Edition and Full and Clear Account of the New Chemical Doctrines Published by M. Lavoisier*. Another edition of the *Dispensatory*, edited by Andrew Duncan Jr, Regius Professor of Medical Jurisprudence at the University of Edinburgh, was published in New York in 1818. Thus, America joins other countries in acknowledging a debt to *The Edinburgh Pharmacopoeia*.

Scottish texts in America

William Cullen's fame in America was reflected in the fact that twenty-four editions of his books were published in Philadelphia, Boston, Worcester, and New York. These included: *First Lines of the Practice of Physic*, *Lectures on the Materia Medica*, *A Methodological System of Nosology and Synopsis*, and *Nosology Being an Arrangement and Definition of Diseases*. Some were translated from the Latin, but the majority were reprinted from English texts.

A copy of *Lectures on Materia Medica as delivered by William Cullen, M.D., Professor of Medicine at the University of Edinburgh* was published in Philadelphia in 1775. Cullen begins with a discourse on the soul and 'the circumstances of its operating within the system' (17).

He concluded:

> We agree therefore with Dr. Boerhaave, that, when a medical problem is prosecuted so far as to be carried to a circumstance depending upon the connexion between the soul and the body, it may be considered solved as for all the purposes of physic (17).

In 1812–13, a beautifully illustrated and reasonably accurate two-volume *Anatomy of the Heart, Cranium and Brain* written by a singular Scot, one Alexander Ramsay (1742–1842), was published in the United States. Born 'to ease and competence near Edinburgh' (18, pp. 237–8), he studied under William Cumberland Cruikshank (1745–1800), and his pupil Matthew Baillie (1761–1823) of the Hunterian School in London, and with Alexander Monro II (1733–1817) at Edinburgh. After completing his studies with Monro, Ramsay established an independent anatomy society in Edinburgh, with a museum, lecture theatre, and dissecting room. A man of talent and education, he was unwise enough to proclaim openly in Edinburgh, 'I acknowledge only two superiors as anatomists, God Almighty and John Hunter' (18, p. 337). This brought down the wrath of the all-powerful Monro, and in 1801 Ramsay, now a lonely and embittered man, sailed for America with a letter from a Scottish clergyman as his only credential. While most Scots who migrated had sought more balmy climates, Ramsay somehow found his way to Freyburg, a small community in bleak and frigid Maine. Here he built a second institute of anatomy, but it was not a success. From

1801 to 1810 he was an itinerant lecturer in anatomy and natural philosophy throughout eastern Canada, New York, and New England, and as far south as Charleston. During a yellow fever epidemic in New York City in 1803, Ramsay fought for the abolition of the then-popular blood-letting, and proposed instead that patients be fed a full diet. Our only information on his demise is that it occurred while he was lecturing in anatomy. He was buried in Freyburg.

The most pervasive Edinburgh influence in America in the eighteenth and early nineteenth centuries was the remarkably popular family medical guide of William Buchan (1729–1805): *Domestic Medicine*. Buchan's first medical contact with families came when as a youth, he served as amateur doctor of his village, Amciam, in Roxburghshire. Sent to Edinburgh to study divinity, he changed to medicine, and after graduation practised in Edinburgh. In 1769, with William Smellie, a typical polymath of Edinburgh, as co-editor, Buchan published *Domestic Medicine*. Nineteen editions, to a total of at least 80,000 copies, were sold in Britain during the author's lifetime. The first American printing appeared in 1771, and subsequently went into thirty-five printings. It seems to have touched every household in America as it had in Scotland: 'Scarcely a cottage but what contains on its shelf the *Domestic Medicine*' (19).

After a general section on the causes of diseases and their prevention, the book contained detailed descriptions of a wide range of disorders. Various supplements were added, such as 'Advice to Mothers' (Charleston, 1807; New York, 1812); 'Advice to Mothers on the subject of their own health; and on the means of promoting health, strength and beauty of their off-spring' (Philadelphia, 1804); and 'A treatise on the art of farriery, with the directions to the purchases of horses, cattle, sheep and swine . . . to all of which are added a choice of collection of receipts, useful in every branch of domestic life—making it in all a complete family directory' (New Haven, 1816). The last printing was in Boston in 1913.

The renowned *Domestic Medicine* was more universally popular on the Continent and in the United States than in Britain. It brought William Buchan, who had moved to London to practise, the final honour of burial in Westminster Abbey.

In closing let me cite a few broader influences from Edinburgh that moulded the ultimate character of the United States of America:

1. The intellectual life of a nation centred around its universities.

2. Educational institutions as the most important agents of social progress.

3. Universities organizing and directing the forces of national progress.

4. The concept of education within a republic—to shape a homogeneous uniform American character.

5. The essentiality of useful knowledge, with a lesser emphasis on the classics.

6. The central role of chemistry (the Cullen–Black influence) in medicine, agriculture, and industry.

Thus, although Edinburgh's influence in medicine is the theme of this discussion, we also pay tribute to the rich Scottish traditions which can truly be said to have permeated every aspect of our new nation—a tradition we applaud and one for which we Americans express our gratitude.

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Edinburgh in the history of medicine

RONALD H. GIRDWOOD

Edinburgh in the history of medicine

Healing in early times

The earliest known source of healing in the Edinburgh area in Christian times was the well of St Triduana at Restalrig, a shrine for those afflicted with eye diseases. Later the well-house was removed to a spring in Holyrood Park, where it still remains, only a short distance from the Palace.

After the Norman Conquest, peace reigned in the Lothians, and on the routes to the monasteries were hospitia in which were to be found monks skilled in the care of the sick. A few ruined remains of Soutra Aisle may still be traced south of the city.

The Knights of St John of Jerusalem

In 1099, when the crusaders had taken Jerusalem, the Order of St John was in existence, probably founded by an Amalfian named Gerard. It is of interest that the medieval Italian Medical School of Salerno was later founded beside Amalfi in 1231. The prime object of the Order of St John of Jerusalem was the building, furnishing, and improvement of hospitals, research in Medicine and the training of doctors and surgeons (1), but in due course it assumed military and naval powers. The hospices were ruled by a Preceptor. It is said that the one in Jerusalem had 2,000 beds. There were nine lay brothers looking after the sick in each ward, and there was provision for maternity cases, with cots for the babies. Four surgeons and four physician-apothecaries served in the hospice. In due course the Knights were driven from Palestine to Limassol in Cyprus, from whence they seized Rhodes, and later they were driven to Malta where they successfully resisted a fierce Turkish siege in 1565.

Exactly 300 years ago, in 1676, a school of anatomy and surgery was founded in Malta and thereafter the Order was able to train most of its own doctors.

The relationship of this to the art of healing in Edinburgh was that the Knights were organized in Tongues according to their country of origin, and the English Tongue included Knights who were English, Scots, or Irish. In Scotland the Knights built their Commandery and Hospital at Torphichen, some twenty-five miles west of Edinburgh, and there they had a hospice for travellers, part of which is incorporated in the building which still stands. The hospitium was built about 1124, and Malcolm IV granted a Royal Charter to the Order in 1153. Its Knights served in Palestine, Cyprus, Rhodes, Malta, and elsewhere, but it is impossible to assess their contribution to the healing arts. The last Scottish Prior, Sir James Sandilands of Calder, was appointed in 1547, but the Order was dissolved in Scotland in 1554.

Scottish universities

By this time there were universities in Scotland, at St Andrews (1410), Glasgow (1451), and Aberdeen (1494). Mary of Guise, mother of Mary Queen of Scots had, in 1556, arranged for two scholars to give lectures in the Magdalen Chapel in the Cowgate in Edinburgh, a building which stands in part. This was comparable to the College de France founded just before this time by Francis I in Paris, but it is not known whether the teaching included reference to the healing arts.

A legacy left by Robert Reid, Bishop of Orkney, in 1558, enabled a College of Learning to be established in Edinburgh. This was the Tounis College, the first civic university in the British Isles, and it obtained its charter in 1582 from James VI. It was not, however, until 1726 that a Faculty of Medicine was established, the main centres of medical progress in Edinburgh in the sixteenth and seventeenth centuries being the Royal Colleges rather than the university.

Royal College of Surgeons of Edinburgh

The activities, in relation to healing, of the monks and of the Knights of St John have already been mentioned. Papal edicts

debarred monks from operations involving contact with blood (2), and the Knights of St John turned to more military activities and also suffered from the religious disagreements of the nations. The barbers who had assisted the clerics now became involved in the operation of phlebotomy. In 1505, in Edinburgh, the Guild of Surgeons and Barbers was incorporated under the Seal of Cause from the Town Council, this being ratified by James IV the following year. (A Royal Charter as a College of Surgeons was granted in 1778.) The Town Council agreed to the use of anatomical material for study. There also were apothecaries, but any academic training of doctors was now to be found in the Netherlands, France, or Italy rather than in Scotland. The Incorporation of Surgeons had, however, appointed a teacher of anatomy in 1647, and, in 1656, developed a physic garden in order that students might be instructed in the other basic subject of botany, and hence of pharmacy. This was now an Incorporation of Surgeon-Apothecaries. It is of note that the Faculty of Physicians and Surgeons of Glasgow, founded in 1599 (in recent times the Royal College of Physicians and Surgeons of Glasgow), always incorporated both surgeons and physicians.

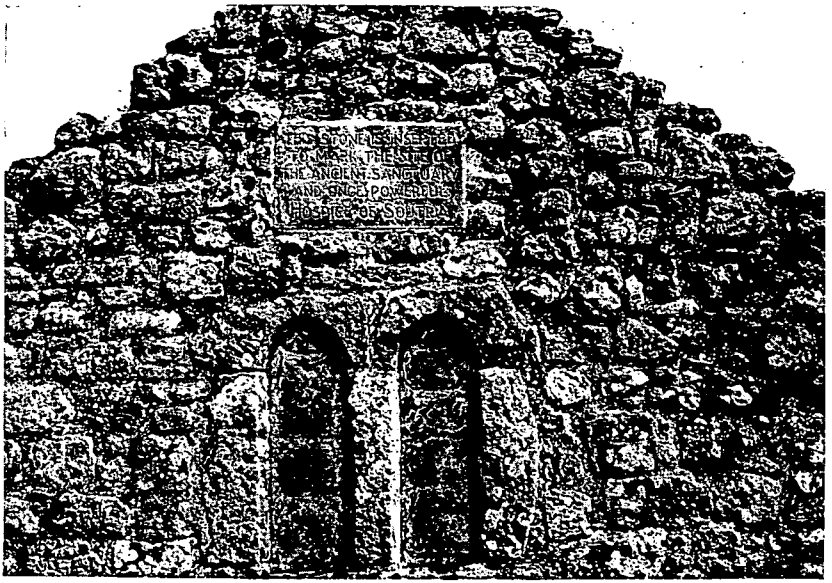
Royal College of Physicians of Edinburgh

The University of Leyden had been founded in 1575, seven years before the Tounis College of Edinburgh, and in the following century it, together with Paris and Montpellier, was a centre of medical education and one to which many Scottish students were attracted, the teaching being in Latin. Of the 4,000 English-speaking students who graduated in Leyden from 1575 to 1875, 2,124 were medical students, and, of these 546 came from Scotland (3, 4, 5). The teachers who attracted the students included Otto van Heurne, Franciscus de Boe Sylvius, Johannes Antonides van der Linden, and, above all, Herman Boerhaave. At Leyden, in the late seventeenth century, there was organized teaching (including that at the bedside in the Caecilia Hospital), an anatomical department, a chemistry laboratory, and a botanic garden, much of all this being modelled on the pattern of the Medical School in Padua (5). This may have influenced the Incorporation of Surgeon-Apothecaries in Edinburgh to include an anatomical theatre for dissections and anatomy teaching when their new hall was built in 1697.

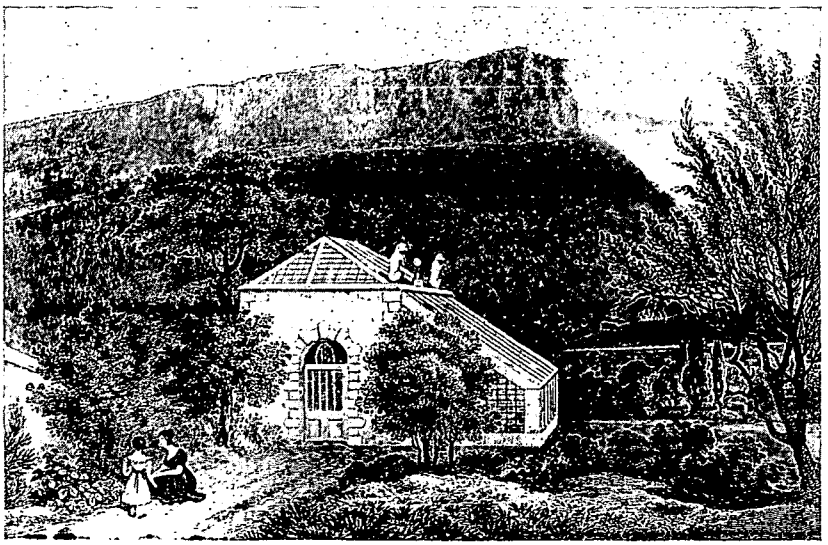
During the seventeenth century, many of the Edinburgh physicians trained in Leyden and elsewhere in Europe felt that the city merited a College of Physicians. Attempts to have one in the reign of Charles I were opposed by the bishops of the Church and by the Edinburgh surgeons. Meantime, the Faculty of Physicians and Surgeons of Glasgow controlled medical practice in the south-west of Scotland. Archbishops and bishops were Chancellors of the Universities of St Andrews, Glasgow, and Aberdeen, and, in Aberdeen and St Andrews, they conferred the degree of Doctor of Medicine, but this was an honorary distinction at this time, not based on examinations. Usually, but not always, the applicants had received medical training at a continental university, and possibly had graduated there. Sometimes they merely purchased the degree. The French revolutionary, Jean Paul Marat, who was stabbed to death by Charlotte Corday, obtained a degree from St Andrew's University in 1775.

During the days of the Protectorate of Oliver Cromwell, a further attempt to found an Edinburgh College of Physicians was opposed by the surgeons, the civic authorities, the Scottish universities and the Glasgow Faculty of Physicians and Surgeons. In 1681, however, largely because of the efforts of Robert Sibbald, Charles II granted a Royal Charter to a College of Physicians in Edinburgh. Sibbald was later knighted.

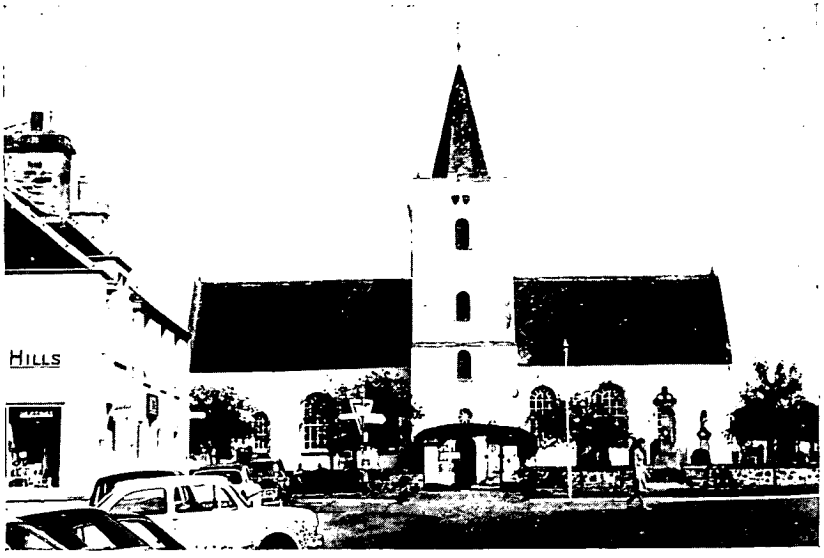
It was not now possible to practise medicine in Edinburgh and its precincts without a licence from this new College. The licence could be obtained by examination, but medical graduates of Scottish universities were exempt from examination despite the unsatisfactory way in which such degrees were awarded in the early days of the College. The Medical Act of 1858 abolished this restriction relating to the practice of medicine in and around Edinburgh. Later, in 1884, in conjunction with the Glasgow College and the Royal College of Surgeons of Edinburgh, the Royal College of Physicians of Edinburgh obtained authority to conduct an examination which would enable the successful candidate to practise medicine without holding a university degree. This was (and is) known as the Triple Qualification. The original Charters of the Colleges did not permit the organization of undergraduate classes, but there were many first-class extramural teachers in addition to those employed by the University. From 1895 to 1948, the Royal Colleges of Edinburgh jointly recognized an extramural undergraduate School of Medicine and this attracted many students from overseas, particularly from the United



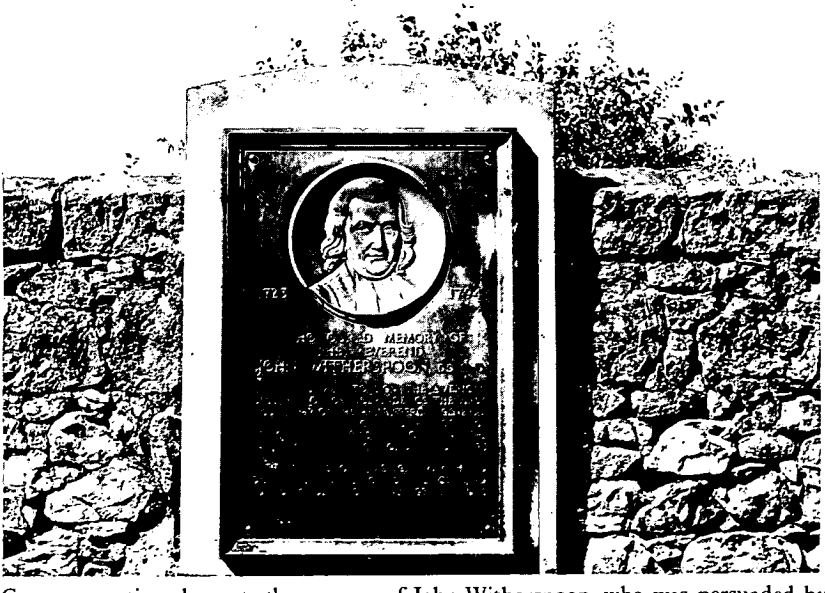
The earliest Hospice cared for by monks in the Edinburgh area, at Soutra Aisle. Established AD 1164.



The Faculty of Medicine was established as part of a plan to restore Edinburgh's declining status after the Treaty of Union between Scotland and England in 1707. The Treaty was signed secretly by some in this summerhouse in the garden of Moray House.



The church at Gifford near Edinburgh.



Commemorative plaque to the memory of John Witherspoon, who was persuaded by Benjamin Rush to go to America.

States. Most of those attending the classes took the Triple Qualification.

Postgraduate teaching on an organized basis was first initiated by the Royal Colleges of Edinburgh in 1906, and this was done by agreement with the University. This activity, mainly one of the Royal Colleges, increased with the passage of time, and, in 1953, there was formed an Edinburgh Postgraduate Board for Medicine, jointly representing the two Royal Colleges and the University.

The number of postgraduates attending the various courses organized by the Postgraduate Board still exceeds a thousand a year. Many come from developing countries and intend to sit the examination for the specialist diplomas of MRCP or FRCS. The control of the Edinburgh Postgraduate Board for Medicine is vested in the University Court. Through this Board the Royal Colleges and the University have had a profound influence on overseas doctors, and much of the fame of Edinburgh medical teaching is based on these postgraduate activities. The early stages of the MRCP and FRCS examinations may now be taken in some overseas countries.

The Faculty of Medicine

So far, it has been possible to refer to the history of Edinburgh medicine, with only passing reference to a University Faculty of Medicine. To bring in this it is necessary to return to the influence of the University of Leyden. Robert Sibbald, who had trained in medicine at Leyden, Paris, and Angiers, together with Andrew Balfour founded a physic garden at Holyrood, and a second one beside Trinity Hospital (on the present site of the Waverley Station). In 1685, Sibbald, together with two leading Fellows of the new Royal College of Physicians (Archibald Pitcairne and James Halket), was appointed to be a Professor of Medicine. The way was clear for the University to undertake medical teaching without quarrelling with the Royal College of Physicians. Pitcairne had already been Professor of Medicine at Leyden for about a year, from 1682, but returned to Scotland for family reasons. In 1685, he quarrelled with the College of Physicians and transferred his allegiance to the College of Surgeons. He was given an MD degree by Aberdeen in 1699, and died in 1713. His grave may be seen in Greyfriars Churchyard.

The possible decline of Edinburgh as a city

Around this time, Edinburgh was in a state of political turmoil. The crowns of Scotland and England had been united under James VI and I in 1603, and in 1707, to the great indignation of the common people of the city of Edinburgh, an Act of Union between the two countries was signed. The Scottish signatories had to flee from the Scottish Parliament to an underground cellar in the High Street, and later to a summerhouse in the grounds of Moray House. In such unlikely places Scotland's national independence was signed away. This is not a political article and the long-term wisdom of this is not being questioned here. With the last adjournment of the Scottish Parliament, the more important of the nobility and gentry moved to London and many of the less wealthy left for country estates. Edinburgh appeared to be on the verge of decline.

There were, however, men of ambition in the city. John Monro, youngest son of Sir Alexander Monro of Bearcrofts, had been a colonel in the army of Charles II at the battle of Worcester, and had served for some years as a surgeon in the army of King William in Flanders. On his retirement he settled in Edinburgh and soon acquired an extensive practice. He became Deacon of the Incorporation of Surgeons. He himself was probably educated at Padua and Leyden.

His son, Alexander, was born in 1697, and for his son's future career the father had great ambitions. Young Monro was taught in Edinburgh, London, Paris, and, finally, Leyden, where he attended Boerhaave's classes. He returned to Edinburgh in 1719 to teach anatomy under the auspices of the Incorporation of Surgeons, and was made a Professor of Anatomy in the Tounis College the following year. At the same time, Dr Charles Alston, also trained in Leyden, was giving lectures on materia medica and botany. In 1713, Dr James Crawford, an MD of Leyden, was elected Professor of Physic and Chemistry in the Tounis College.

John Monro visualized the establishment of a national medical school and, being *ex officio* a member of the Town Council, he was able to interest that body in the project, at a very suitable time in the fortunes of the city. Moreover, he and his son were able to obtain support from both the Incorporation of Surgeons and the Royal College of Physicians.

The Union of the Parliaments had led to the loss to the city of a Parliament, a Privy Council, a Treasury, and much trade. The Town Council was in dire economic straits. The great saviour of the situation was George Drummond, who became Lord Provost of Edinburgh in 1725. He was descended from the knightly house of Stobhall and was born in 1687. A Hanoverian and supporter of the Union, he fought against the Jacobites at Sheriffmuir in 1715. Indeed, when the young Pretender's forces came to Edinburgh in 1745, he rejoined the army and fought against them at Prestonpans. He was largely responsible for the creation of the first Royal Infirmary and enthusiastically supported the plans for the building of the new town of Edinburgh. It can readily be understood that such a man would support the Monros in their plan for a Faculty of Medicine, and it must be realized that this support was essential since the Tounis College was a civic university. The aim was to have a medical school with properly organized courses of instruction culminating in the granting of the MD qualification after suitable examination. In fact, the University had begun to confer MD degrees in 1705, the examinations, however, being conducted by the Royal College of Physicians. It was hoped to attract to Edinburgh students from England, Ireland, and the colonies. There was nothing comparable in Scotland, and, in the two English universities of Oxford and Cambridge, there was a longer period of residential study, few lectures, and no clinical teaching.

1726 and the years that followed

In 1726, a Faculty of Medicine was established, largely by the transfer of extramural teachers. Those appointed that year were: Anatomy and Surgery: Alexander Monro; Chemistry and Medicine: Andrew Plummer, John Innes; Institutes of Medicine (Physiology) and Practice of Medicine: Andrew St Clair, John Rutherford; Botany: George Preston; Midwifery: Joseph Gibson.

Teaching was in Latin or English, but much of the examination, including a dissertation, was in Latin.

This was the first complete university medical school in the British Isles, based on the example of Leyden. The standard of teaching was high, and to the school flocked students from many countries, particularly from the New World. This last aspect has been dealt with by Dr Bowers, but it is perhaps of interest to state that John

Morgan and William Shippen, who founded the Medical School in Philadelphia, not only graduated at the University, but also applied for the licence of the Royal College of Physicians and were made Fellows with little delay. Moreover, Dr Benjamin Rush, a graduate of Edinburgh University who signed the Declaration of Independence, was instrumental in persuading John Witherspoon (born at Yester in East Lothian, some twenty miles from Edinburgh) to travel to America in order to become President of Princeton College. Witherspoon was the only cleric to sign the Declaration of Independence. The family grave is at Gifford church, where he preached.

Since it was founded in 1726, about 26,000 doctors have graduated at the University of Edinburgh, several thousands of postgraduates have attended courses, and many others have received some undergraduate instruction. In addition, thousands of overseas doctors have obtained qualifications from the Royal Colleges in Edinburgh.

The influence of Edinburgh on world medicine

The influence of Edinburgh on world medicine cannot easily be measured. Each student, whether undergraduate or postgraduate, must take something of Edinburgh with him when he returns home, and many of the Edinburgh teachers have spent periods teaching or carrying out research in universities or medical schools in all parts of the world. The number of medical textbooks produced by members of the teaching staff is enormous, and research papers, many of high quality, flow out in a never-ending stream. Research workers attract overseas graduates to their laboratories. The large contribution of Edinburgh graduates to the Indian Medical Service and to the medical services in both world wars has been related by Craig (2). It is perhaps sufficient to state that any Edinburgh graduate would expect to find another one very rapidly in any theatre of war, and that the Edinburgh Royal Colleges have very many local Fellows or Members on the Indian subcontinent.

Time does not permit consideration of the contribution of Edinburgh graduates to medical science, but it is perhaps worth mentioning in 1976 that it was in 1776 that William Withering, an Edinburgh graduate of 1766, first used the foxglove as a therapeutic agent.

British medical schools

It is possible to identify more precise influences on individual schools. For instance, Richard Bright and Thomas Addison were Edinburgh graduates who had a profound influence on Guy's Hospital in London. Nepotism in relation to professional appointments did not add lustre to the reputation of the Edinburgh Faculty about a hundred years after it was established, and Alexander Monro III, who held the Chair of Anatomy from 1808 till 1846, was certainly not a success. Charles Bell, a first-class anatomist of that time, moved to the Middlesex Hospital in London in 1812 and became Head of the new Medical School established at University College in 1826. He obtained a knighthood, and returned to the Chair of Surgery in Edinburgh in 1836. Another founder of the Middlesex Medical School was James Moncrieff Arnott (graduate of Edinburgh in 1813), but any further discussion of the Edinburgh influence on English and Irish medicine would, no doubt, be tedious. It is perhaps enough to say that John Cheyne of Leith, a graduate of 1795, had a profound influence on the creation of the Dublin Medical School, and that Graves, Corrigan and Stokes all received at least some training in Edinburgh, the last two graduating there.

In Tables 1 and 2 there are shown, by kind permission of the Royal Scottish Museum, names of notable former Edinburgh medical students as listed in an exhibition mounted by the Museum to commemorate the 250th anniversary of the Faculty of Medicine.

Table 1

Henry Wentworth Acland (1815–1900)	President of the General Medical Council
Thomas Addison (1793–1860)	Discoverer of 'Addison's disease'
Thomas Barnardo (1845–1905)	Philanthropist
George Birkbeck (1776–1841)	Founder of mechanics' institutions
Richard Bright (1789–1858)	Discoverer of 'Bright's disease'
John Conolly (1794–1866)	Reformer of lunatic asylums
Astley Cooper (1768–1841)	Surgeon to Guy's Hospital
Alexander Crichton (1763–1856)	Reformer of medicine in Russia
James Crow (1789–1856)	Bourbon whiskey distiller
Charles Darwin (1809–82)	Natural historian and evolutionist
Arthur Conan Doyle (1859–1930)	Creator of Sherlock Holmes
James Esdaile (1808–59)	Medical hypnotist

W. G. Grace (1848–1915)	Cricketer
Elsie Inglis (1864–1917)	Organizer of military hospitals
James Kay-Shuttleworth (1804–77)	Founder of popular education in England
James Mackenzie (1853–1925)	Cardiologist
Mungo Park (1771–1806)	Explorer
James Cowles Prichard (1786–1848)	Anthropologist and ethnologist
John Pringle (1707–82)	President of the Royal Society
William Prout (1785–1850)	Pioneer of physiological chemistry
P. M. Roget (1779–1869)	Thesaurist
Benjamin Rush (1745–1813)	Signatory of the Declaration of Independence
Samuel Smiles (1812–1904)	Author of *Self Help*
James Edward Smith (1759–1828)	Founder of the Linnean Society
Thomas Southwood Smith (1788–1861)	Sanitary reformer
William Stokes (1804–78)	Reformer of Irish medical education
Charles Tupper (1821–1915)	Prime Minister of Canada
Robert Willan (1757–1812)	Dermatologist
William Withering (1741–99)	Experimenter with digitalis
Thomas Young (1773–1829)	Ophthalmologist, philologist, Egyptologist

Table 2

Baghdad	
Harry Sinderson (1891–1974)	First Dean, Baghdad Medical College
Barbados	
William Wright (1735–1819)	Physician to the military hospital
Baroda	Exchange fellowships, 1963–9
Birmingham	
Edward Johnstone (1757–1851)	Founder of the medical school
Bombay	
Charles Morehead (1807–82)	First Principal, Grant Medical College
Bristol	
Thomas Beddoes (1760–1808)	Founder of the Pneumatic Institution
Calcutta	
Henry Goodeve (1807–84)	Founder professor, Calcutta Medical School
Cambridge	
John Haviland (1785–1851)	Regius Professor of Physic
Dublin	
Abraham Colles (1778–1843)	President of the College of Surgeons
George Kidd (1824–95)	Founder of the Stewart Institution

John Cheyne (1777–1836)	Founder of the medical school
Robert Graves (1797–1853)	Founder of the *Dublin Journal of Medical Science*
David Macbride (1726–78)	Secretary of the Medico-Philosophical Society
Dunedin	
John Scott (MD 1877)	First Dean of the Otago Medical School
Millen Coughtrey (MB 1871)	Founder professors
Duncan MacGregor (MB 1870)	Founder professors
Louis Barnett (1865–1946)	Founder of the Royal Australian College of Physicians
Halifax	
Charles Tupper (1821–1915)	Founder of Dalhousie University Medical School
Khartoum	
Andrew Balfour (1873–1931)	Director of the Wellcome Tropical Research Laboratory
Kingston, Ontario	
John Stewart	Founder of Queen's College
Lima	
Hipolito Unanue (1755–1833)	Pioneer of South American medical education
Liverpool	
John Rutter (1762–1838)	Founder of the Liverpool Medical Institution
Thomas Traill (1781–1862)	Founder of the Royal Institution
William Banks (1842–1904)	Founder of the medical school
London	
David Pitcairn (1749–1809)	Founder of St Bartholomew's Medical School
James Arnott (1794–1885)	Founder of Middlesex Hospital Medical School
Charles Locock (1799–1865)	Founder of London University
William Sharpey (1802–80)	Professor of Physiology, University College
Andrew Clark (1829–93)	Physician to the London Hospital
Robert Ferguson (1799–1865)	First Professor of Midwifery, King's College
John Yellowly (1774–1842)	Founder of the Royal Society of Medicine
Madras	
James Anderson (1738–1809)	First President of the Medical Board
Manchester	
Charles White (1728–1813)	Founder of the Manchester Infirmary

Maryland	
John Davidge (1768–1829)	Founder of the College of Medicine of Maryland
Montreal	
Andrew Holmes (1789–1860)	Founders of the Montreal Medical Institution (afterwards McGill)
John Stephenson (MD 1820)	
William Robertson (1784–1844)	
William Caldwell (1782–1833)	
Francis Arnoldi (MD 1827)	First President of L'Ecole de Médecine et de Chirurgie
Nazareth	Edinburgh Medical Missionary Society Hospital
New York	
David Hosack (1769–1835)	Founders of the College of Physicians and Surgeons
Samuel Mitchill (1764–1831)	
Nicholas Romayne (1756–1817)	
Samuel Bard (1742–1821)	Founder of King's College Medical School
Oxford	
John Burdon-Sanderson (1828–1905)	Regius Professor of Medicine, founder of the 'modern' medical school
Philadelphia	
William Shippen (1736–1808)	Founders of the medical school
John Morgan (1735–89)	
Adam Kuhn (1741–1817)	
Benjamin Rush (1745–1813)	
Quebec	
Joseph Morrin (1794–1861)	Founder of the Marine Hospital Medical School
St Kitts	
James Grainger (1721–66)	Investigator of tropical disease
St Petersburg (Leningrad)	
James Wylie (1768–1854)	Founder of the Medico-Chirurgical Academy
Alexander Crichton (1763–1856)	Head of the Civil Medical Department
Robert Erskine	Archiater
Sheffield	
William Younge (1762–1838)	Founder of the Royal Infirmary
Sydney	
Arthur Renwick (MD 1861)	Founders of the medical school
Henry Maclaurin (MD 1857)	
Thomas Stuart (1856–1920)	Founder of the Institute of Tropical Medicine

Overseas schools outside the United States

The relationship with McGill University in Montreal has always remained close. The foundation of the University and of its Medical School was largely due to Edinburgh influences and the first teachers, appointed in 1824, were from that city. The first President of L'Ecole de Médecine et de Chirurgie, founded in Montreal in 1843, was Dr Arnoldi, an Edinburgh graduate of 1827, and numerous other fellow-teachers were from Edinburgh. The founding of a medical school at Dalhousie University in Halifax, Nova Scotia, also had the stimulus of an Edinburgh graduate, Dr Charles Tupper. In due course, he became Prime Minister of Nova Scotia. It is interesting that the Edinburgh Medical School has produced more than practising doctors and numbers among its alumni several prime ministers and heads of state.

In Australia, the foundation of the Medical School at Sydney was largely due to the influence of men who had obtained their medical training in Edinburgh. The first Australian to graduate in Edinburgh was in 1846, but the University of Sydney appointed Dr (later Sir) Thomas Anderson Stuart, who graduated in Edinburgh in 1880, to begin the Medical School in Sydney in 1883; and for nearly twenty years he was Chairman of the Royal Prince Alfred Hospital. Many of his colleagues also were graduates of Edinburgh.

In New Zealand, Dunedin was founded in 1848 when pioneer ships arrived to populate the town planned by the New Edinburgh Settlement. An ordinance in 1869 enabled the establishment of a University there, with Faculties of Arts, Law, and Medicine. It opened in 1871, but the Medical Faculty commenced in 1875. Dr Millen Cougherty, an Edinburgh graduate of 1871, started this Otago School under certain difficulties, but a new Professor of Medicine from Edinburgh, Dr John Halliday Scott, took over in 1877. Thereafter, links with Edinburgh remained strong.

In 1963, under the auspices of WHO, Edinburgh set up an experiment on advising about medical education at Baroda Medical School in Gujerat State, India. The scheme continued for six years, with exchange of staff. It is hoped that there was some lasting benefit.

The Forces

The Royal Navy. James Lind was born in 1716 and became apprenticed to an Edinburgh surgeon at an early age. He joined the naval medical services and performed his well-known studies on scurvy at sea. He published an account of this after he left the Navy and it was not until 1748 that he graduated MD. He then became Medical Officer at Haslar Naval Hospital. Had it not been for Lind's discovery of the fact that oranges and lemons taken during long voyages would prevent scurvy, it is unlikely that Captain Cook would have reached New Zealand in 1769 or New Holland (Australia) in 1770. It is equally unlikely that Captain Arthur Phillip, RN, later the first Governor of New South Wales, would have reached Botany Bay and Port Jackson (Sydney) in HMS *Sirius* in 1788. But for Lind's discovery the future development of Australia might have been very different. The first Medical Director-General of the Royal Navy was William Burnett, who studied in Edinburgh and entered naval service in 1795. Many other eminent senior officers of the naval medical services were trained in Edinburgh.

The British Army. Sir John Pringle, son of a baronet, began medical studies in Edinburgh the year the Faculty began, then went to Leyden where he graduated MD. He became both a physician and Professor of Moral Philosophy in Edinburgh, then, in 1742, was appointed physician to the Earl of Stair, Commander of the British Forces in Flanders and was physician to the Military Hospital there. He became Physician-General to the Forces in the Netherlands, having, before that, secured an agreement between Lord Stair and Marshal Noailles that military hospitals on both sides should be regarded as neutral. He later accompanied the Duke of Cumberland to Culloden where Sir Stuart Threipland, Bart, also an Edinburgh MD, was the Principal Medical Adviser to his adversary, Prince Charles Edward. In 1772, Pringle was elected President of the Royal Society in London. The Battle of Culloden, which took place in 1746, was the last one to be fought in Britain, and mention of what took place there can still cause anger in the Highlands of Scotland. In the corridors of the Royal Infirmary of Edinburgh there is a list of donors, and on one panel it will be seen that the Duke of Cumberland donated £50 in 1748.

In the nineteenth century, there were many senior Army doctors who had graduated in Edinburgh. Thus, Sir George Balingall, who graduated in 1819, later returned as Professor of Military Surgery. James Miranda Stuart Barry, who graduated in 1812, became an Inspector-General of Military Hospitals in Canada, and, after death, was found to be a woman and hence the first female to graduate in the British Isles. Valuable research work on tropical diseases was done by Sir David Bruce, who graduated in 1881, and the term brucellosis remains as a tribute to his work.

Other armies. Reference has already been made to the Indian Medical Service. During the American War of Independence, it has been stated that not only Benjamin Rush, but at least three other senior doctors working with him had graduated in Edinburgh.

In Russia, James Mounsey, from Dumfriesshire, was working in the Naval Hospital at St Petersburg in 1736, but was, as yet, unqualified. He graduated MD in Rheims in 1740 and was involved in the wars of the times, but married the daughter of Dr James Grieve, an Edinburgh MD of 1733, who was physician to the Empress Elizabeth of Russia. He himself later obtained this post. John Rogerson, a nephew of Mounsey, was born in Dumfriesshire and graduated MD in Edinburgh in 1765. He became adviser to Empress Catherine II of Russia. The true founder of Russian military medicine, however, was Sir James Wylie of Kincardine-on-Forth, who graduated in Aberdeen in 1794.

The Polish Medical School in Edinburgh

Finally, mention must be made of one unique event in the history of the Edinburgh Medical School. When Poland was overrun by the Germans and Russians, many members of the Polish Army escaped and came to Scotland. Lieutenant-Colonel Professor F. A. E. Crew, Professor of Public Health in the University of Edinburgh, was, at this time, Commanding Officer of the Military Hospital at Edinburgh Castle, and his vision and imagination created the idea of a Polish Medical School that would be attached to Edinburgh University. Agreement was reached in February 1941 and the first Polish Dean was Professor A. Jurasz. The School continued until 1949, and, in all, 227 medical students graduated in the Polish School.

At the 250th Anniversary Celebrations of the Faculty of Medicine in 1976, the Polish School was well represented and made a presentation of a specially executed painting of Cracow University. The University of Edinburgh agreed that graduates of the Polish Medical School would thenceforth be eligible to take the higher degrees of Doctor of Medicine or Master of Surgery of Edinburgh University. In addition, those who already held the higher qualification of Doctor of Medicine of the Polish Medical School might, if they wished, wear the Edinburgh University gown and hood.

Thus was further cemented the happy association between colleagues of the two nations.

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3

The growth of scientific medicine

ALEXANDER G. BEARN

The growth of scientific medicine[1]

I suppose we all sometimes feel that there may be a certain gap in understanding between the bureaucrats who control the allocation of funds and those of us who work in the real world. Jacques Barzun has recently reminded us of the fable of the cricket and the sparrow, which stands as a warning to legislators, reformers, administrators, even professors of medicine. The sparrow was complaining of the winter cold. The cricket advised the sparrow to turn into an insect like him for a few months each year and keep warm next to the hearth. 'A perfectly wonderful idea', said the sparrow, 'How do I do it?' 'Oh,' said the cricket, 'I only make policy, I don't implement it.'

The inclusion of a discussion on the growth of scientific medicine in a programme devoted to medical education and medical care could be interpreted simply as representing that spirit of spurious generosity that permits a condemned man the opportunity to utter a few last words before the trap is sprung and he falls into intellectual and bodily irrelevance. Alternately, it may, as I like to believe, represent the view that the roots of medical education and health care must be kept alive, indeed nourished by the waters of verifiable knowledge.

I hope I will not fall into the foolishness and mischievous over-simplification that promises a modern Utopia of health based on science alone. Rather it is my intention to try and emphasize the key role that I believe medical science must increasingly continue to play as we cope with the urgent and pragmatic issues of medical education and health care in our society.

Any serious discussion concerning the development of scientific

1. Delivered at Macy Conference on Medical Education and Medical Care, University of Edinburgh, September 1976.

knowledge and its application to medicine, must take into account the historical influence of diverse societies in many lands over a span of more than two thousand years. Without so much as a tinge of embarrassment, I leave this Toynbeean gauntlet to be grasped by other hands, more suited by training and temperament for such a task. I shall take a more limited and less global view and discuss certain highly selective scientific developments which seem to me to have had a profound effect on medical education and practice and that have taken place since the Edinburgh Medical School was founded two hundred and fifty years ago.

Today, science, even science and its application to medicine, is on the defensive. We are told constantly that the relevance of much of science to medicine and medical practice is obscure at times, science itself is under attack. We should, I think, be neither surprised nor overly dismayed, nor do we have to relate the public scepticism of the benefits of science to man to the development of the nuclear age. It was an ancient tradition that passed out of Egypt into Greece that a god, who was an enemy to the repose of mankind, was the inventor of all sciences. Astronomy was born of superstition, geometry of avarice, physics of idle curiosity, and even moral philosophy out of human pride. Small wonder, then, that if the sciences sprung more from the vices of mankind than from its virtues they should be under grave suspicion. This attitude, espoused and elaborated by Rousseau in his *Social Contract*, was the accepted view in the eighteenth century. It would, of course, be well to admit at the outset that the application of scientific knowledge to medicine, until the last hundred years, has as often spawned quackery as medical progress. The application of electricity, magnetism, and mixed herbals has caused harm as well as good. In Mozart's *Cosi Fan Tutte*, you will remember how Despina, the maid of Fiordiligi, disguised as a doctor brings forth a huge magnet to counteract the arsenic which Ferrando and Guglielmo have pretended to consume. A certain honesty compels me to remind you that this extravagant fol de rol was highly effective! Neville Cardus, in his autobiography *My Life*, refers to the advertisements in the daily papers in the 1880s which dramatically showed the virtues of an 'electricity belt'—a coil wrapped around the belly which when turned on promptly exorcised disease to the accompaniment of an impressive number of fireworks (1). While we tend complacently to ridicule the cupping and bleeding of our predecessors, it was not so long ago, a mere

twenty-five years, that I was using Southey's tubes to relieve dependent oedema. We probably also need to remind ourselves that a large number of hospital admissions are related to the uncontrolled, misplaced, and ill-advised therapeutic enthusiasm of physicians.

An early attempt to draw attention to the quackery and 'commonly pursued truths' was the publication of *Pseudodoxia Epidemica* by Sir Thomas Browne (2), even though he himself had difficulty in freeing himself from the shackles of alchemy and the iron yoke of conformity that characterizes every generation, including, let us admit, our own. Browne's final paragraph is followed by an apt quotation, taken from Lactonius, which sums up his principal purpose in writing the book: 'Primus sapiente gradus est, falso intelligere' ('The first step in wisdom, is to know the false'). Is it not still true that the failure of a new idea, as Walter Bagehot once remarked, 'is one of the greatest pains we are ever asked to bear'?

Although Karl Pearson took the view that the unity of science consists in its method, not its material (3), it is probably the case that the majority of advances in the sciences, whether in physics, chemistry, or biology, ultimately have a bearing on the practice of medicine. It is the inevitable delay that tires the patience of man in his hurried quest for laudable but often illusory and Utopian goals. The discovery of the circulation of the blood by William Harvey not only did nothing for the physicians of the day, but often incited their wrath. Descartes, who may be regarded as the first to advocate the reductionist approach to biology, regarded the discovery of the circulation as 'la plus belle et la plus utile que l'on peut faire en médecine', but another contemporary rather more tartly observed that the discovery 'made no change in the practice of physic, and so has been of little use to the world, though, perhaps, of much honour to the author' (4). The importance of Harvey's work surely lies in its experimental nature. His stirring injunction 'to search out and study the secrets of nature by way of experiment' is quite as important today as in Harvey's time. The motto of the Royal Society, taken from one of the letters of Horace, expresses a similar thought: 'The words are the words of the master, but we are not forced to swear by them. Instead we are to be borne wherever experiment drives us' (5).

Although Robert Hooke's preamble to the Statutes of the Royal Society specifies that it should not 'meddle with Divinity, Metaphysics, Morals, Politics, Grammar, Rhetoric or Logicks', from its

early beginning the Royal Society has often concerned itself with large issues. However, it is not my mandate to enlarge on the social functions of science, a matter which has been most elegantly discussed by Lord Ashby in his Bernal Lecture in 1971 (6).

The Edinburgh faculty of medicine had its inception two hundred and fifty years ago, in 1726; even at that time, almost exactly one hundred years after the publication of *de Motu Cordis* (7), the voices of science in medical affairs were barely audible. Indeed, until the nineteenth century, advances in science had little or no impact on the affairs of medicine in general, let alone the practice of medicine. The belief that scientific discoveries would have an effect on the conduct of human affairs was a point of view that was held neither by the public nor scientists themselves. The classical retort of Faraday, when he was asked by a disdainful politician to comment on the usefulness of his discovery of electromagnetic induction, was 'Some day, Sir you will collect taxes from it'. The relevance of scientific discovery is not always immediately apparent, and frequently may be delayed for several decades. Before the first half of the nineteenth century the influence of science on the practice of medicine was negligible. The various attempts to systematize knowledge from Boerhaave in Holland to William Cullen of this school did not reveal a new principle in the same way that Newton's generalization had brought order out of chaos in physics. The fact that many of the leading physicians of an earlier period were scientists did nothing for the practice of medicine. Copernicus and Galileo read medicine; William Gilbert, physician to Elizabeth I and James I, as well as President of the Royal College of Physicians, is usually credited to be the father of magnetism. The fact that fourteen out of the original nineteen members of the Royal Society were physicians merely reflects the scholarly role that physicians, trained in science and natural philosophy, have played over the years.

I hope I shall not be taken to be insensitive to the general sweep of human history, or thought totally ignorant of the development of science in medicine, if I take the publication of Claude Bernard's *Introduction to the Study of Experimental Medicine* in 1857 to be one of the bench marks of the development of science in medicine (8). A physiologist of incomparable originality, he did not believe that medicine was 'une science a faire', but instead embraced physiological experiments as a way to illuminate human disease. He emphasized that 'doctrines and systems' were artifacts of men's

minds and did not exist in nature (9). In sharp contrast to Magendie, he insisted that in any experimental science there should first be a leap of the imagination, a hypothesis, which could then be tested. His hope, however, that physiological studies would quickly revolutionize medical practice proved overly optimistic. A revolution in medical practice was accomplished by another Frenchman, Louis Pasteur, who was largely responsible for replacing an outmoded vitalism with a doctrine of specific aetiology, a point of view originally espoused by an astute physician, Pierre-Fidèle Bretonneau, who could not believe that the many infectious diseases he saw among his patients in Tours could be due to one and the same cause (10).

Although it is fashionable, indeed appropriate, to emphasize the harmlessness of most of the organisms that live in association with humankind, formulation of the doctrine of specific aetiology enabled a great leap forward to be undertaken in our scientific understanding and treatment of human disease. The principle that disease could be caused by specific agents led rapidly to improvements in medical care; the development of antitoxins by von Behring was a direct consequence of the work of Pasteur and Robert Koch. And, although the emerging science of bacteriology was too disturbing to be embraced by university faculties, an institute was built for Pasteur in 1888; in 1891, an Institute for Infectious Disease was built in Berlin for Koch, who in 1882 had discovered the tubercle bacillus. A few years later, in 1901, the Rockefeller Institute for Medical Research came into being.

We are inclined to think that the extreme rapidity of scientific and medical advance is a phenomenon peculiar to our time, yet the application of Pasteur's work proceeded so rapidly that, by 1886, the causes of tuberculosis, typhoid, cholera, glanders, anthrax, pneumonia, and, let us not forget, wine spoilage, were all well known.

One of the first applications of the work of Pasteur to medical practice had deep roots in this medical university. Thomas Anderson, Professor of Chemistry in Glasgow, is usually credited with bringing the work of Pasteur to the attention of Joseph Lister. As a surgeon with a Quaker conscience, Lister was devastated that, even in the best of hands, wound infection following surgery was the rule, and over one-third of all patients who underwent surgical amputation died from infection. The triumphs and setbacks in the life of Lister are too well known to need further amplification, except to reaffirm that Lister's concept of antisepsis, and later asepsis,

stemmed directly from the germ theory of disease. It was a discovery that was in every way as miraculous as the introduction of antibiotics. Indeed, in today's climate, where basic science, even when applied to medicine, is under attack it is important to emphasize that antibiotics would still be undiscovered, or more precisely would be looking for a job, had not the basic observations on specific aetiology been made seventy-five years earlier. As Lewis Thomas has recently reminded us, the triumphant science of immunology may have had a prolonged latent period, but its origins are squarely rooted in the scientific observations of Pasteur and Koch (11).

The doctrine of specific aetiology had relevance for fields other than infectious disease. The vitamin deficiencies were sorted out from the general problems of malnutrition in the early part of this century. Yet the delay in the application of this knowledge to many populations exemplifies the complexity and inadequacy of health care delivery in many parts of the world. Vitamin A deficiency is a major cause of blindness in India and south-east Asia. Many of the anaemic in the world, and there are several millions, could be cured by the addition of a little ferrous sulphate. While the reductionist approach of science has defined the abnormalities of many tropical anaemias with great precision, the translation of that knowledge into adequate health care is often appallingly inadequate. None the less, prevention and treatment of disease is now reaching firmer grounds. The isolation of specific causes for mental retardation, such as phenylketonuria, may not have made a significant dent in the over-all problem of mental retardation, but it has shown how an excess of a single normal substrate can exert a profound effect on the complexities of brain function.

The diseases of the tropics, well described as the white man's grave, began to be differentiated in 1894 when Patrick Manson a young Aberdonian serving in the Far East observed the malarial parasite in the blood of patients with malaria. Three years later, on 20 August 1897, Ronald Ross, a young Indian Army doctor discovered the same malarial parasite in the stomach of the spotted-wing anopheles mosquito. The final proof came when Manson, in 1900, followed the scientific postulates laid down by Koch, allowed an infected mosquito to bite his own son who immediately contracted the disease. Although it has required the lapse of more than fifty years for drugs, other than quinine, to be developed to combat the disease, mosquito control including the simple case of

mosquito netting in infested areas, has had a marked effect on mortality.

The spectacular triumphs in genetics and their application to human disease had their origins not only in the work of Mendel and Darwin but also in the clinical studies of the brilliantly perceptive Archibald Garrod. It was he who originated the term 'inborn errors of metabolism' and appreciated the direct relationship of genes to enzymes.

In a recent book, *The Path to the Double Helix*, Robert Olby traces the high road of molecular biology (12). It really all began in 1869 when a chemist, Fritz Miescher, isolated a substance he called nuclein from the cell nucleus. The exploding knowledge in molecular genetics and its relation to man is one of the crowning biological achievements of this century. Yet, an anonymous reviewer of *The Path to the Double Helix* could write in 1975, 'medical readers will note with frustration that, although another generation has passed, the spin-off from the elucidation of the molecular structure of DNA is still almost wholly intellectual' (13). Although it must in fairness be said that the reviewer also implied that the slow unfolding story of DNA had policy implications for research support, this statement seems to me to miss an important point. It is somewhat reminiscent of Faraday's retort to the question 'What is the use of electromagnetic induction', referred to earlier. The reviewer was still 'frustrated' that the finding by Avery, MacLeod, and McCarty in 1944 that DNA was the genetic material (14) and the further elucidation of that structure by Watson and Crick in 1957 did not have an immediate impact on medicine and the treatment of human disease. This narrow view clouds the impact of genetics on the practice of medicine: Genetics is now part of medicine and is inextricably woven into the fabric of pathogenesis. The science of genetics has allowed the ill-defined concepts of diathesis to be clothed in scientific reality. Indeed the entire teaching of medicine has been changed: genetic influences on the causation of human disease can now be defined, often with immense precision. Twelve million Americans are carriers of genetic disease. Thirty-six per cent of miscarriages are caused by chromosomal defects, and genetic factors account for 40 per cent of all infant deaths. The development of amniocentesis and selective abortion has not only limited, in certain instances, the birth of affected individuals but has lifted the load of mental anguish from hundreds of families. The recent newspaper

announcement that Har Gobind Khorana and his colleagues have synthesized a gene from 'off-the-shelf chemicals' which functions normally when implanted in a bacterial cell is an extraordinary achievement and will undoubtedly lead to a better understanding of genetic control mechanisms: the whole question of 'what makes genetic functions stop and start' (15). Even if the impact in practical therapeutics may not be a great deal closer than the twenty-five years that many cautious scientists have been predicting, the opportunity to study 'tailor-made' genes in the laboratory is likely to give further insights into cell biology, the molecular mechanisms of carcinogenesis and genetic disease.

The current debate on the relative importance of basic science, clinical science, and health services research is one to which I must address myself although I can add very little. Much of the debate invariably centres on the wise deployment of restricted funds (16). I believe the swing of the pendulum that emphasized health care research at the expense of basic research may be beginning to swing back. The issue, in a sense, is false and should not be clouded by the emotional rhetoric which stridently asks: 'Do you want science or service?' Science must play an essential role in the delivery of a service if it is to be effective. As Sir John McMichael has succinctly put it: 'It's not a matter of science or service, science supports service' (17). The essential differences between basic research and applied or mission-oriented research, were well analysed by Lord Ashby, who draws this distinction: basic research lies within the discipline itself, and 'cannot be defined or truly understood by persons outside the discipline and the solutions obtained are valid only within the framework of the discipline' (6). Mission-oriented research, or applied research, although still using the discipline of basic science, has as a goal the solution of a problem easily understandable to the educated layman. The principal difficulties arise when problems of great medical significance are not readily approachable using the techniques of basic science. That cigarettes cause lung cancer is beyond serious cavil (although we still know next to nothing about how they bring about this malignant change); the remedy is clear: stop smoking. However, if we are to allow freedom of choice rather than legislative action to deal with this and other similar problems, more understanding of factors that alter human behaviour and compliance may be needed.

Since I have, in a rather arbitrary way, focused on certain specific

discoveries, I would like to close by making some remarks concerning the continuity of science. The ever-rising structure of knowledge in the biomedical sciences and its application to medical practice is built on a foundation of the evolving exact sciences. Accelerated progress is usually made by the unanticipated, unexpected creative idea, an idea which to have ultimate validity must be shown to be true. Confirmation of a hypothesis is weak evidence that the hypothesis is correct: far more effective, as Popper has emphasized, is its ability to withstand attempts at refutation (18). Many a hypothesis remains on the books longer than it should because the experiments have sought only ways to confirm it.

Future progress in the clinical and biomedical sciences is assured but we still have far to go. The view advanced by Lord Platt that few major discoveries of importance come from clinical departments is, I think, a little misleading (19). Observations of clinical importance are always being made at the bedside and directly influence patient care. I do not have time to document all of these, but the influence of protein intake on hepatic precoma, and the importance of leucine in the precipitation of hypoglycaemia are clear-cut examples that come quickly to mind. Dickinson has recently reviewed the subject in analytic detail in a recent Ciba symposium (20). Today we know next to nothing about the causes of atherosclerosis, schizophrenia, congenital defects, and chronic renal disease, to name only a few. We have developed ineffective halfway measures to cope with their effects—the coronary care units, mental hospitals, and dialysis units—and these will have to do until we understand the diseases in more intimate detail, and we won't be able to do that until more research of high quality is carried out. It is, moreover, a personal conviction that as long as diseases remain largely ill-understood a large-scale frontal approach is not likely to yield useful results. We need above all to support the young gifted investigator with an idea. The exploitation of ideas, on the other hand, can often be accomplished by group effort and massive technological support, often pharmaceutical. Crash programmes designed to cure cancer in ten years have been, predictably, of limited value. In 1976 the National Cancer Institute spent approximately $109 million to investigate oncogenic viruses, leaving only $29 million to investigate all other viral disease. Yet 25 per cent of doctor visits are due to infections, of which perhaps 80 per cent are viral in origin. Basic studies on cell surfaces, cell division,

differentiation, immunological recognition and communication are sure to illuminate the field and bring within the next several generations containment of the neoplastic process.

We also need to recognize that, in addition to basic science, there is a need to develop and continue clinical science at the bedside. We must continue to study the structural and functional determinants of disease and to understand, in considerably more detail than we now know, the molecular mechanism involved in the pathogenesis of disease (21). The importance of clinical science in both education and research has been recently emphasized by Campbell (22). We must study our patients. We must collaborate with epidemiologists in well-organized clinical trials, to work in association with basic scientists in the solution of clinical problems. We still remain very ignorant, as Campbell has cogently pointed out, in understanding some of the commonest of the symptoms that afflict mankind: fever, anorexia, obesity, weight loss, constipation, and diarrhoea.

As I reviewed the topics of the other speakers at this symposium I began to feel alone in emphasizing the importance of the scientific method in the solution of medical problems. Yet as a physician who has been in charge of a large medical service in an urban centre for more than ten years, I am not unaware of the staggering inadequacies in coping with disease. All day and every day, we are forced to make what we hope are adequate decisions on woefully inadequate evidence. We are not altogether comfortable living in a world of uncertainty, but we have grown accustomed to it. Moreover, we would be both blinkered and disingenuous if, in our molecular enthusiasm, we failed to admit that many of the major problems in health care relate as much to sociological perturbations as they do to biological problems; inescapably, therefore, societal priorities and goals will play a powerful and critical role in the solutions of these problems. Educational deprivation, poverty, poor housing, and inadequate facilities for transportation of the sick and the elderly to health centres all conspire to provide a medical burden of staggering proportions. The cure for most of these ills must rest on social and political action; physicians can play an important leadership role, but all too frequently they lack the special expertise needed to effect a change. The social and behavioural aspects of alcoholism, drug addiction, compulsive smoking and eating are complex and ill-understood, and the toll they exact, in terms of human health and happiness, is beyond calculation. However, a greater understanding

of the biological and biochemical basis of behaviour and its modification will undoubtedly lead to a better control of these problems. As McDermott has pointed out we don't necessarily have to effect a social change to alleviate disease. Isoniazid has reduced the death-rate from tuberculosis in a dramatic fashion, yet the urban slums in which tuberculosis was so rampant have not been materially improved (23).

We are, whether we like it or not, a civilization with knowledge and its integrity as its axial thread. The past leaves no alternative; future generations will not forgive our short-sightedness were we now to lose our scientific nerve.

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4

Edinburgh and general practice

RICHARD SCOTT

Edinburgh and general practice

The public dispensary and the medical school

The provision of medical care on a voluntary charitable basis has been a feature of most medical schools in this country, particularly in the early years of their establishment. Sometimes this took the form of extending their out-patient facilities and clinics to patients who made their way there without a letter or referral from a general practitioner. (Most of these patients, of course, did not have a general practitioner.) In other instances medical dispensaries for the sick poor were established by charitable bodies. There were many different patterns of the relationship between these bodies and the local medical school. In many instances the doctors supplying this voluntary service were themselves members of the honorary staff of the local medical school. In Edinburgh the role of the dispensary in the provision of medical care and in the education of medical students was a particularly prominent feature. The deliberate establishment of dispensaries for undergraduate teaching purposes was probably unique. This can be traced directly to the influence of the Leyden medical school on the University of Edinburgh. When a Faculty of Medicine was established in Edinburgh in 1726, each of the occupants of the newly created chairs had previously studied as a postgraduate in the medical school of Leyden.

Andrew Duncan, Professor of the Institutes of Medicine and later of the practice of physic, had, like his contemporaries, added to his postgraduate experience in Leyden, and there he was inspired by the teaching methods which had been developed by Hermann Boerhaave. Such methods were certainly in his day unique. It is no exaggeration to say that medical educators prior to Boerhaave had been fairly successful in separating, almost entirely, medical educa-

tion from medical care. The significance of Boerhaave's contribution was his introduction of clinical methods of teaching. The professor elicited symptoms and signs from the patient and demonstrated the skills of history-taking and physical examination of the patient in the presence of his students. In Boerhaave's case this was carried out largely on an in-patient basis at his voluntary clinics in the St Caecilia Hospital on Wednesdays and Saturdays.

What Andrew Duncan did in Edinburgh in 1776 was to establish the Royal Dispensary for the Sick Poor. There he and some of his academic colleagues provided direct access for the poor to a medical service, in a building which was separate and independent of the medical school and the University as such. Although this project incorporated the common charitable purposes of that day and was indeed from the beginning granted a Royal Charter in recognition of this, it was Duncan's idea that the project could from the very beginning harmonize its charitable objects with the promotion of new methods of undergraduate education. Duncan was in fact practising as a general practitioner as indeed did many of his professional colleagues of that day. In other words, he offered direct and continuing access to him on the part of Edinburgh's sick poor. Andrew Duncan's students thus had the opportunity to watch a physician at work, actually delivering medical care. Medical teaching and medical care were thus fused, and the student was taught not only by precept but also by example. This teaching in fact incorporated a form of apprenticeship. Furthermore, there was an additional component of the teaching being carried out from the public dispensary. The sick poor who were too ill or infirm to come to the dispensary were able to submit a request for a home visit. These home visits were in fact carried out by Duncan's students, in other words his apprentices, so that students were actually seeing illness and sick people outside the confines of the hospital walls, in the open community, in their own homes.

Practical clinical teaching based on public dispensaries which was set up in the early years of the Edinburgh Medical School continued as a feature of the medical curriculum up until the launching of the National Health Service in 1948. The form and content of the teaching, of course, varied with major changes not only in clinical medicine, but in the developing features of society which determined the emerging pattern of medical care. Some of these will be referred to later. What is of particular interest to our main theme is

that Andrew Duncan himself not only was a great innovator in the teaching of clinical medicine, but foreshadowed the development of medical jurisprudence as an academic discipline, and his son, in fact, carried these ideas further, and himself laid the basis for what was to become the first chair of public health and preventive medicine. We will see how the emergence of general practice as an academic discipline in the United Kingdom in the mid-twentieth century was closely identified with major changes in public health. It would appear, therefore, to be perfectly logical that social and preventive medicine as it rapidly evolved in the post-war era was probably more likely in Edinburgh than anywhere else to provide the launching pad for the establishment of a chair of medicine in relation to general practice and this, in fact, came about in 1963, when the University of Edinburgh established the first such chair in the United Kingdom.

Community medicine and the medical faculty (1)

A feature of the rapid growth of medicine, particularly in the middle and late nineteenth century was the differentiation between the spheres of medicine and surgery, followed by the rapid growth and subdivisions of these specialties. The blossoming of the new science of bacteriology led to major changes in our concepts of pathology and in the content of our teaching. Medical schools began to earn the title of centres of excellence and became the spearhead of research and development. At the same time as these major changes were occurring in medical knowledge, major changes were occurring in society itself, and these changes were not always reflected in the current thinking and teaching of the medical schools. The evolution of a highly urbanized society produced its own problems of social pathology which were later characterized by Beveridge (2) as the five giants of Want, Disease, Ignorance, Squalor, and Idleness. It is to be noted, however, that it was the poet, the writer, the administrator, the philanthropist, the politician, and the reformer rather than the doctor as such, who first reacted to the grosser manifestations of social pathology. The movements which they initiated were certainly in evidence by the beginning of the nineteenth century. A continuing and concentrated attack on the five giants culminated in a spate of social legislation reaching its peak in the early 1940s, which in turn led to the foundation of what came to be known as the Welfare State. I think it is relevant to bear in mind that in the early social

recognition of some of these problems and in calling for the appropriate social legislation, medicine itself was not by any means in the van of progress (for example, the control of outbreaks of cholera in London in the first half of the nineteenth century).

The first medical officer of health was appointed in Liverpool in 1846 and in a sense the legislation and provision for the public health came early in an era of reform which reached its height with the passage of the Medical Act in 1858 and the establishment of the General Medical Council.

With the appointment of medical officers of health there came the institution of a postgraduate diploma in public health, and regulations drawn up by the General Medical Council regarding the curriculum, standards of teaching, and courses and the examination of candidates for this diploma. The possession of the diploma became a prerequisite for any applicant for the post of medical officer of health. This in turn guaranteed a steady flow of candidates presenting themselves for courses leading to the diploma, and ensured that adequate provision would be made for training.

In its earliest days the General Medical Council set out to raise the standard of undergraduate teaching so as to ensure the end product of a 'safe' doctor (3). The basis for this was laid in the series of decennial recommendations as to the medical curriculum issued by the Council. From the very first of this series of recommendations there has always been specific reference to the field of public health and preventive medicine. Medical schools were thus required to pay specific attention to these subjects in their basic courses.

The establishment of the diploma in public health in due course led to the establishment of postgraduate institutes of public health, of which by far the most important in this country was the London School of Hygiene and Tropical Medicine. The London School of Hygiene and Tropical Medicine became the United Kingdom's 'centre of excellence' for teaching and research in this particular branch of medicine. It had much in common with the School of Public Health associated with Johns Hopkins University, which in turn grew and flourished as a result of the great surge of interest and change in medical education which stemmed directly from the Flexner report.

There is a paradox in the United Kingdom, which has special significance for the Edinburgh medical school. While half of our annual output of medical graduates have completed their training in

one or other of the fifteen medical schools associated with the University of London, which in turn is associated with the London School of Hygiene and Tropical Medicine, none of these London medical schools themselves provides a postgraduate course for the diploma in public health, and until very recently practically none of these schools had any major programme for the teaching of public health at the undergraduate level. Graduates from the London medical schools, as well as those from other universities, seeking a possible alternative to the excellent courses provided by the London School of Hygiene and Tropical Medicine itself, had of necessity to turn to the so-called provincial university medical schools for the appropriate postgraduate training in this subject. The establishment of a postgraduate diploma course in public health and social medicine, for example in Edinburgh, ensured that an academic Department of Public Health and Social Medicine, actively involved in postgraduate training and in research in this field, was staffed by individuals who were also undertaking undergraduate education and training. Thus, what represented recent advances in research in this field yesterday and was incorporated in the postgraduate training of yesterday became in turn incorporated in the undergraduate training of today. In other words, there existed a mechanism for incorporating a continuous flow of advances in this subject into the undergraduate curriculum of the medical school.

Furthermore, the head of the undergraduate Department of Public Health and Preventive Medicine was a fully active member of the Faculty of Medicine of the University. The Faculty structure of the provincial university enabled, and indeed encouraged, the head of such a department and his departmental colleagues to develop liaison with colleagues in other faculties—in the social and behavioural sciences—and more formally with the Faculty of Social Science. Thus, this relationship has been a profitable and important feature of Edinburgh medicine and has enabled social and preventive medicine to make its particular contribution to introducing the faculty of medicine as a whole to current concepts being developed and researched in the social and behavioural sciences.

Interrelationship between community medicine and general practice (4)

The Second World War brought a temporary arrest to postgraduate training in public health and preventive medicine, yet paradoxically also saw a major reorientation of our thinking about the nature of public health and the emergence of at least a new name for an old discipline: social medicine. The first postgraduate courses in social medicine began in Edinburgh in January 1946, under the leadership of F. A. E. Crew, who was given the task of interpreting the entirely new recommendations issued by the General Medical Council for the teaching of this new discipline.

In the immediate postwar era the change from public health and preventive medicine to the concept of social and preventive medicine brought about a change of emphasis in the new and expanding departments of social medicine, with the emergence of two factors:

(*a*) The establishment of the modern concept of epidemiology as an academic discipline as well as an instrument not only for the study of the natural history of disease but also for the study of the medical care process itself.

(*b*) A wider acceptance of the WHO definition of health led to an increasing preoccupation with the social and behavioural sciences and to the idea that the most pathogenic agent in man's environment is man himself—and man-made institutions. The arrangement for the provision of medical care is itself a man-made institution. The study of medical care programmes, therefore, should proceed in parallel with the study of the natural history of disease.

The inception in 1948 of a comprehensive health service covering the entire population focused attention on the relationship between hospital and specialist services and general practice. The field of general practice, now more clearly defined, had three unique features of particular interest to the discipline of social medicine. Firstly, it was concerned with a definable population (the patients actually registered with a practice). Secondly, it offered uninhibited and direct access of the patient to a named doctor and therefore opportunities for studying the nature of primary diagnosis and the early beginnings of disease or departure from health. Thirdly, the general practitioner under the provisions of the NHS had a clear responsibility for the provision of continuity of care, and thus general

practice appeared to be a particularly attractive field for anyone wishing to study the natural history of disease (echoes of James McKenzie).

For these reasons the idea grew and received increasing acceptance that medical schools in general and departments of social medicine in particular might exploit general practice as a research laboratory and/or an extension of its teaching resources.

To those who adopted such an approach what soon emerged was an unlimited scope and range of problems sitting waiting to be studied —problems relating to tasks of early diagnosis, problems relating to opportunities to study and promote knowledge of prognosis, studies of medical care itself and particularly the social component of diagnosis and treatment in the primary care field—the role of ancillary and paramedical personnel—the study of illness and its impact on other members of the family, and work studies including the relationship between general practice and hospital specialist practice, between general practice and the preventive services of the local health authority, and between the work of the general practitioner and a wide range of statutory and voluntary agencies.

The evolution of the Department of General Practice

In 1946 the Department of Public Health and Social Medicine at the University of Edinburgh initiated a study in a community setting, of the needs of families for medical and social care.

On 5 July 1948 the NHS was inaugurated and on that day the Department of Public Health and Social Medicine at Edinburgh University established a teaching general practice in the premises of the Royal Public Dispensary which had been founded by Andrew Duncan in 1776 and was about to become redundant with the advent of the NHS.

In 1952 the project attracted support from the Rockefeller Foundation. The University received a grant spread over five years for the purpose of developing a second similar unit in order to extend its teaching facilities and the General Practice Teaching Unit came into being. It comprised two separate practices each with approximately 3,000 patients, and each staffed by two doctors and a medical social worker, all holding full-time academic appointments, who were joined by a nurse and supporting secretarial staff. A doctor seconded from the Department of Social Medicine, acted as director

of the unit while continuing in active general practice. Fees earned by the practice were paid directly to the University. The unit was financed partly by the Rockefeller Foundation, therefore, and partly by the University. During the five years which followed, the number of students offered practical training (three months for each student) was increased, but since it was possible to take only half the class of fifth-year students the course was an elective one. At the end of the period of financial support by the Rockefeller Foundation, the Faculty of Medicine of the University reviewed the situation and decided that the teaching facilities should be further extended and that the programme be made compulsory for all medical students. This came into effect in October 1959.

In 1957 the General Practice Teaching Unit, therefore, became an independent teaching unit of the Medical School, the head of the unit being directly responsible to the Dean advised by a committee of the Faculty. From this point on the unit was financed entirely from University funds although the income from the practice continued to defray the cost. In order to reinforce the teaching facilities provided by the full-time staff in these two practices a number of general practitioners in independent practice throughout the city were recruited and given part-time lectureships in the Department which were renewable on an annual basis.

In 1959, with financial support in the first instance from the Nuffield Provincial Hospitals Trust, a diagnostic centre open to all general practitioners in Edinburgh was set up in the premises of the Department at Livingstone House where the second practice was located. This provides a series of consulting rooms to which any general practitioner may bring his patient for full physical overhaul. Nursing, secretarial, and technical staff are available. Diagnostic radiology, electrocardiography, biochemistry, and haematology can be carried out on the premises on the general practitioner's instruction. While this is a service open to all general practitioners in the city, it is, of course, also available to the doctors involved in the teaching of medical students and is used to extend the student's experience in diagnosis and management of patients in the setting of general practice outside the hospital.

In 1963 the trustee body responsible for the Royal Dispensary became extinct and donated its premises and remaining funds to the University. This enabled the Department to improve its premises and equipment. At the same time, the University received a generous

donation from the Sembal Trust which has laid the basis for an expansion of activity in the field of postgraduate training and research. Finally, the preparatory work begun two years previously which led to the establishment of the James Mackenzie Chair of Medicine in Relation to General Practice was completed and the first Professor was appointed in 1963.

In June 1969 as a result partly of population changes in the area served by the practice at Livingstone House, and partly in pursuit of trends towards group practice that are in evidence throughout the country, it was decided to amalgamate the two practices and to streamline the work of both in the premises at Mackenzie House. This is now the practice headquarters, while Livingstone House is retained as the administrative teaching and research headquarters.

The Department, as it now exists, provides medical care for a core population of approximately 6,000 patients as well as training for medical students and in-post training for the staff of the Department. Research is pursued in the setting of general practice to extend the knowledge relevant to both the academic and professional problems confronting the general practitioner. The activities of the Department in medical care, teaching, and research, are integrated with clinical and para-clinical departments in the medical school. Specific vocational training is provided for postgraduates preparing themselves for a career in general practice and for doctors already established in this field of medicine.

In addition to the full-time practice there are fourteen general practitioners in the city holding part-time lectureships who use their practices to augment the Department's resources for practical training of medical students. These doctors are themselves in independent partnership or groups. The fourteen practices have, in fact, an average of three doctors per practice. With one exception each of these practices operates from a single set of premises. The doctors involved directly in student instruction are personally responsible for a population in the region of 35,000. The remaining staff of the Department hold full-time University appointments. With three exceptions, all members of the teaching staff are directly involved in the provision of medical care in the setting of general practice.

The Department makes a considerable contribution to the undergraduate medical course. In the first year a sociologist member of the Department makes a substantial contribution to a first-year course entitled 'Psychology and Sociology in Relation to Medicine'.

Currently individual members of the Department take part in interdisciplinary colloquia, seminars, and discussion in the undergraduate fourth-year course entitled 'The Nature of Diseases'. During this year, each student is given a completely free choice for an elective period of two months. A substantial number of students take a general practice elective at this time, and this can be arranged in Edinburgh, but students are encouraged to take up their period of elective studies in other centres in the UK or if possible overseas. Finally, the fifth year in the current curriculum comprises two terms only. Half the class has a programme based on general practice for the first term and in the second term exchanges with the other half, i.e. all students have a course in General Practice extending over one term. This course does not use didactic methods, since the learning process is based on observation by the individual student in the context of day-to-day general practice together with small group seminar teaching.

The basic objective

The basic objective of the Department as far as undergraduate education is concerned, is to exploit the circumstances of general practice much in the same way as Andrew Duncan himself did nearly two hundred years ago, to enable the student to see the doctor being confronted by the patient with a completely unrehearsed and undifferentiated problem and for the student as the doctor's apprentice to be introduced to this situation in which he himself in turn is similarly confronted. Thus the student is provided with a problem-solving exercise in which he is invited to apply the theoretical knowledge and skills which he already possesses to a real and practical situation. It is not our purpose to engage in teaching the subject of general practice as such which we regard as a matter for postgraduate training as distinct from undergraduate education. Our objectives are, of course, in line with the rapid change which has occurred in the recommendations as to the medical curriculum in the past thirty to forty years, with its move away from the concept of the doctor who will graduate 'safe' to practise medicine, to the notion that the objective of the medical school is to provide a basic medical education which is truly basic to all medical graduates, whatever their postgraduate destiny may be.

Emergence of vocational training for general practice (5)

Our undergraduate objectives were, of course, reinforced with the publication of the findings of the Royal Commission on Medical Education published in 1968. The gradual acceptance and implementation of the major recommendations of this report have greatly influenced the emergence of patterns for general professional training and the emergence of higher qualifications and specialist professional training for all medical disciplines. The Royal Commission report sets forth and highlights the features of major change that had evolved in the whole field of general practice particularly over the period 1950–65. The Commission also gave a high rating to the work that had already been achieved by the Royal College of General Practitioners, a new body which had only been established as recently as 1952 but which had already been able to outline a feasible programme for the development of vocational training and continuing training for general practice.

For a number of reasons, which need not be spelled out in detail, the medical faculty of the University of Edinburgh played a particularly important role in the rapid evolution of vocational training programmes for general practice. While individuals and departments in the medical school gave a great deal of their time and resources, the traffic was by no means one-way, and the medical school in turn has benefited from the widely based contact which it enjoys with the generality of family doctors practising in its hinterland.

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5

Medical education in the USA since the Second World War

SHERMAN MELLINKOFF

Medical education in the USA since the Second World War

Looking back upon American medical education from the period in which my classmates and I were a bit hurriedly changed from students to doctors in the armed forces reminds me of a story about Robert Benchley. As an undergraduate at Harvard, he once glumly contemplated a highly technical final examination question on treaties affecting the international rights of Canada and the United States to harvest codfish. The young Benchley began his essay by acknowledging almost total ignorance of the subject from the point of view of the fishermen, the lawyers, and the politicians. 'Therefore,' he explained, 'I have decided to discuss this complex subject from the point of view of the codfish.' An impersonal perspective is difficult. Although I am certainly unqualified to speak for the codfish, and do not, I have tried to listen to a few.

American medical schools in 1940 were generally far better in quality and fewer in number than they had been when the Flexnerian revolution began around 1912. The Johns Hopkins model was not universally duplicated, but it was widely emulated. Private, state, and local funding patterns varied, but fear of federal control barred funding from Washington for medical education. The precedent of federal aid to American universities for such other purposes as promoting agricultural research, dating from the land-front policies of Abraham Lincoln, was not regarded as applicable to medicine.

In 1940 a new era began in federal relationships with American universities. Born of military necessity, the National Research Defense Council's inclusion in the wider scope of the Office of Scientific Research and Development and the timely leadership of Vannever Bush, John B. Conant, and others led to rapidly increasing federal support of university research, including biological research.

The Office of Scientific Research and Development spent $100 million in 1940, and $1·6 billion in 1945 as the Second World War ended. The landmark Bush Report, *Science—The Endless Frontier*, in 1945 noted that 'for many years the Government wisely supported research in agricultural colleges and the benefits have been great. The time has come when such support should be extended to other fields' (1).

The specific Bush proposals—a National Research Foundation encompassing natural sciences, medical research, and national defence—were not implemented in that form, but the central ideas materialized in other shapes. Thus the National Science Foundation was given, and still has, a relatively small budget, while the National Institute of Health and, to lesser degree, the Office of Naval Research and other military agencies were given considerable sums of money, much of which was allocated to universities, especially medical schools, largely on the basis of peer-reviewed research grant applications. In 1947 over-all American expenditures for medical research were $87 million, and the federal share 31 per cent; by 1966 the total expenditures were $2·05 billion, and the federal share 68 per cent. In two decades the total support of medical research increased twenty-four-fold. James Shannon, long-time director of the National Institutes of Health, with the support of such statesmen as Senator Lister Hill and Congressman John E. Fogerty, was a key figure in the fruitful expenditure of these riches.

The monetary support of research, although technically not given for education because of persisting political taboos, had a revolutionary and lasting effect on American medical education. Scientific and technical discoveries in which America participated along with the other technologically developed nations of the earth, transfigured medicine and therefore the teaching of it. New specialties were born as new knowledge burgeoned. In brief, the medical 'schools' (as they are still traditionally called) became in fact medical 'universities'. The transformation, to be sure, had begun long before the Second World War, but after the war the rate of change was of a different order of magnitude.

My own professor of medicine, Arthur Bloomfield, once pointed out that when he was a medical student it was possible for an assiduous scholar to cover all of medicine in the four-year curriculum, whereas by the time Bloomfield was teaching medicine, into the post Second World War era, not even the most ardent and brilliant

student could possibly cover all of medicine in a lifetime. Therein lies the inevitability of specialization, and the growth of full-time medical faculties logarithmically from 1945 to the 1960s.

In 1967, Thomas Turner, then Dean of the Johns Hopkins School of Medicine, referring to the post-war impact of the National Institutes of Health, observed that

> . . . this vast program has enormously strengthened the medical schools of the country and greatly enhanced the quality of medical education, although, until the Health Professions Educational Assistance Act of 1965, no funds were voted by Congress directly for medical education. The great university medical centres of America—all eighty-eight of them, not just a few—have become the vital links in the health program of the country in at least two major respects. First, the university medical centers are the principal sources of health and medical manpower of the nation; second, for the communities in which they are located, they constitute focal points of excellence in medical practice, points from which improvements in preventive and curative medicine are likely to stem (2).

In the 1960s, however, social and economic pressures long in the background began to press vigorously on the forefront of medical education. As far back as 1932, the Committee on the Costs of Medical Care, chaired by Ray Lyman Wilbur (3), had trenchantly sought to call the country's attention to the growing disparity between the medical excellence available to portions of the population and the mediocre or nonexistent care obtainable in certain areas and by some groups. There did ensue a proliferation of health insurance plans and group practice arrangements of several kinds. But progress in what one might call 'social' medicine or what has to my aesthetic sorrow become known as 'health care delivery' was overshadowed first by the great depression, then by the Second World War, and then, ironically, by the scientific and technological progress in medicine which made more marked the differences between the best and the worst, while simultaneously making the best much more expensive. For every nearly complete victory, such as mass prevention of poliomyelitis, which saved millions of dollars, there are bound to be incomplete advances, such as renal dialysis and kidney transplantation, which will continue to be extremely expensive until more of nature's defences against corporal invasion are sufficiently well understood to make them accessible to safe and beneficial manipulation.

In the last decade there has been a crescendo of demands on medical educators from lay groups, from governmental bodies, from writers of various political and philosophical persuasions, and from within the profession itself. There have been appeals for more physicians, especially more physicians able to provide primary care; a better geographic distribution of physicians; financial availability of excellent medical care for all; access to medical careers for segments of the population historically underprivileged in education, including some ethnic minorities and women; and curricular reformation of several kinds, including shortening the curriculum, diversifying the curriculum, and what some have called 'humanizing' the curriculum, on the assumption that 'hard' sciences make students less interested in helping people whereas social sciences and compassionate 'role models' will make students more sympathetic healers.

It is difficult to assess the net effect of all these pressures, especially as they are exerted in a changing social and economic climate. A few years ago campus riots were spawned at the modern nadir of public morale during the tragic war in Vietnam, but currently, I think, there is a resurgence of optimism and a sense of national purpose after the Watergate scandals and in celebration of the country's 200th anniversary year.

Perhaps the clearest change in medical education in the decade 1965–75 was an increase in the number of medical schools from 89 to 114, and in the number of graduates from 7,800 to 14,300 annually. Some of the new schools are still in developmental stages, but it would appear from reasonable extrapolations that by the time presently evolving or planned medical education reaches a more or less steady state in the mid 1980s the physician : population ratio will be about 200:100,000; higher than in any other country except Israel and the Soviet Union, where the situations are for a variety of reasons not comparable.

A second fairly general trend in American medical schools has been to give greater emphasis to the training of 'primary care' physicians. Many different approaches have been launched, including the creation of departments of family practice, divisions of family practice within departments of medicine, and enlarged concentrations on the primary physician role played by general internists, general paediatricians, and obstetricians. It remains to be seen which approaches will be most helpful and in which locales, for the

logistics of medical care are by no means homogeneous in New York City, the Mojave Desert, the Hawaiian Islands, and Alaska. There is no doubt, however, that the current national trends are in the direction of greater production of primary physicians. Between 1963 and 1973 the percentage of active physicians engaged in general practice, family practice, internal medicine, or paediatrics fell slightly from about 48 to 41. In the same period, however, the first-year enrolments in medical schools rose from 8,772 to 14,185, and between 1960 and 1973 the percentage of primary care residencies rose from 31 to 37. In 1976 there were 16,112 residency positions available, of which more than 50 per cent (8,213) were in the primary care specialties of family practice, general practice, internal medicine, and paediatrics.

These trends have evoked mixed reactions. There remains in some political circles a determination to compel each medical school to produce certain rigid quotas of primary physicians, or to mandate or financially reward shortening of the medical curriculum at a time when it is far from clear that the total supply of physicians and the voluntary move towards primary care are not already adequate.

Meanwhile, many medical educators have been concerned about the effect on educational quality of increasing social and political perturbations, especially when the latter are not wholly untainted by an irrational anti-scientific passion. Quality, of course, has long been difficult to measure. The Greek philosopher Phaedrus, in the fifth century BC, is said to have lost his sanity trying to define quality. Without claiming to have solved Phaedrus' problem, it is nevertheless disconcerting to note that the maximum seven-year accreditation certified by the Liaison Committee on Medical Education for American medical schools, due for review between 1966 and 1970, was achieved by 72 per cent, while the comparable figure for the years 1970–5 was 37 per cent.

Many have asked, with John Gardner: 'How can we preserve our aspirations (without which no social betterment is possible) and at the same time develop the toughness of mind and spirit to face the fact that there are no easy victories? How can we make people understand that if they expect all good things instantly, they will destroy everything?' (4). Furthermore, many would agree with David Saxon, president of the University of California, that: 'There is an increasing tendency to try to make universities vehicles for social justice. But universities cannot by themselves erase the mistakes of the

broader society, nor can they attempt to translate equality of *opportunity* into a guarantee of equality of *result* without compromising fundamental principles' (5).

With these important caveats in mind, some of my colleagues view morosely the course of American medical education since the early 1960s. It is possible to find data to support their lugubrious extrapolations. Some of the zealous demand for curricular change, for example, remind me of a small news item which appeared in the *University of Tennessee Daily Beacon*. 'I hope', the story read, 'the semester system is not being sought as a pancreas for all the ills of the quarter system.' Certainly it has become more difficult, especially in financially difficult times, to respond to social needs judiciously without weakening the scientific vigour on which genuine progress in medical care and medical education historically and endlessly depends.

But what is difficult is not impossible, and there are also reasons for optimism. Looking back not ten years but fifty, there can be no doubt that quality medical education and the inseparable flourishing of science have become too deeply rooted in too many places to be swept aside easily. At the same time, American medical schools are not the immovable objects, the academic Maginot lines, they are said to be in some colourful orations. Without abandoning sound academic principles, there has emerged a willingness to devise better ways of making good medical care more widely and readily accessible to all. If all these experiments have not succeeded, neither have they all failed, nor has the spirit of inquiry and critical reappraisal.

Surely these days are sufficiently turbulent to cause any medical dean to sympathize with Charles Chauncey, President of Harvard College from 1654 to 1672, who complained of extramural burdens because '... the greatnesse and multitude of college busynesse doeth require the whole man and one free from other distractions'. At that time Harvard was graduating an average of five students annually! No wonder the half-life of medical deans, university presidents, and professors of medicine is now so short. But if 'man born of woman hath few days and is full of troubles', he is also blessed with great opportunities, a cumulatively powerful scientific heritage, freedom to think, and occasionally a Robert Benchley to speak for the codfish.

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6

Trends in medical education in Britain since the Second World War

HENRY J. WALTON

Trends in medical education in Britain since the Second World War

A number of influences have combined to raise the concern of medical school staff in Britain with their teaching responsibility. None the less, there are still many who view their teaching unashamedly as a direct function of their specialty practice, and show little technical interest in such educational matters as the relative effectiveness of different teaching methods, the reliability and validity of evaluative procedures in regular use, the findings of medical education research, or the evidence from sociological studies of the medical school as an institution. Such educationally uninterested medical teachers often dismiss educational considerations by claiming that a 'good doctor' cannot be defined, and refuse to entertain the possibility that much can be understood about medical training by focusing on proximate rather than on ultimate outcome criteria. Admittedly, the efficiency of medical schools needs to be explored by systematic *studies of outcome*, along the lines of the ten-year investigation by Fredericks and Mundy (1) of the 1962 entry to Loyola University School of Medicine, and the follow-up report awaited from Betty Mawardi (2) about professional careers of doctors qualifying at Western Reserve. The belief that all other approaches are dwarfed by the over-riding need to get information about outcome was stated explicitly by Alan Gregg:

> I wonder why we don't all stop writing about education and just as a bit of exploration collect 500 or 1,000 cases of what actually happens. . . . Nobody seems to have studied education by the case system. Might there not be something in it? (3)

That doctors should show a preference for the clinical method for medical education research is both sensible and understandable. But

to regard this long-term outcome approach as the only path to understanding is indefensible; it is in the same tradition as the view that medical teachers are sufficiently equipped by their mastery of their medical specialty and can neglect educational theory and practice.

A relative scotoma for the educational sciences and a disregard of the findings of medical education research is the more surprising in members of a profession which is a science as well as an art.

The Association for the Study of Medical Education is the organization in Britain which provides a forum for medical teachers and for schools and other educational bodies, where interests and issues in medical education can be discussed. Founded in 1957, ASME has no executive function and seeks none. Through its office, now at Dundee, the Association aims to promote medical education interests of its individual members and of its corporate members (the medical schools, the Royal Colleges, and other organizations and bodies concerned with medical education). It also seeks to promote research into medical education. It conducted large-scale surveys of medical students in the United Kingdom in 1961 and again in 1966; a further study of this cohort of students has just been conducted (4). The Association's journal, *Medical Education*, now appears at two-monthly intervals. The Association is a corporate member of the European Association for Medical Education, which links the medical educators and medical schools in the countries within the European Region of the World Health Organization. AMEE has recently held meetings in Edinburgh (on the selection of medical students [5]), in Linköping (on the introduction of new subjects into the curriculum [6]), and in Berne (on the contribution of medical education to primary health care). By linking the national associations for medical education throughout Europe (in the larger geographical context indicated), more opportunity is provided for countries to learn from the achievements and problems of neighbours. Meetings for the following two years are planned in Madrid, Uppsala, Warsaw, and Maastricht.

As problems in the training of doctors become more clearly defined and measures are sought for relieving them, process investigations will become more generally accepted to explore the different parameters in medical education and in specialist training. Medical schools have been required to admit larger numbers of students, and are doing so, although the effects of increasing class size are known to be adverse (7). Widely discrepant selection procedures are in use,

and how one school's method is better than another's has not been studied. The proportion of women entrants rises steadily, but the consequences of the change in sex ratio are not being monitored systematically. Career preferences of medical students are out of step with requirements for manpower in the NHS in Britain, but this disparity is also not as yet a matter for study.

The Report of the Royal Commission on Medical Education

Appointed a decade ago, the Royal Commission has exerted great influence on the development of medical education in Britain since its report appeared in 1968 (8). The Commission made blunders, such as the recommendation that Behavioural Sciences can be taught to medical students from departments outside the medical school. It made brave attempts at reforms which did not come to pass, such as its effort to deal with the insufficient academic development in the London medical schools and their divorce from the postgraduate institutes, the expertise in which is lost to undergraduate education. But two very considerable effects the Royal Commission did have. It fostered the revolution in postgraduate medical education that is occurring in Britain, promoted by the greater educational activities of the Royal Colleges, the setting up of the Councils for Postgraduate Medical Education, and the formation of Joint Committees on Higher Training for each of the specialties.

The second major influence of the Royal Commission was to rehabilitate general practice. At a time when 'family medicine' was becoming almost extinct in the United States and early specialist choice was being promoted, the Royal Commission set a course in which the outcome of medical school education in Britain was to be a basic doctor, ready to avail himself of further training; in the postgraduate sphere general practice was now to rank equally with the other specialties.

The Royal College of General Practitioners responded energetically to this encouragement. With proper attention to principles of educational planning, the College devised training methods and specified educational objectives in a field that formerly had been grounded largely on an apprenticeship training pattern (9). The results are already evident. Rotational postgraduate training programmes for general practitioners are functioning in many parts of the United

Kingdom, and the impression is that some of the ablest graduates from the medical schools now choose to enter vocational training for general practice. (This branch of medicine used to attract the graduates who were the least able intellectually, as Last has shown [10].)

In some quarters the Royal Commission is regarded as a failure, and one reason advanced by the critics is that the Commission did not seek to set the administrative structures necessary for implementing its recommendations. (The relevant legislation was not provided by Parliament.) The Merrison Committee (11) has since reported, and has advised that an Education Committee of the General Medical Council should have responsibility and also statutory authority for both of the phases in medical education differentiated by the Royal Commission: undergraduate medical education followed by postgraduate training. Merrison proposed an intermediate phase, graduate clinical training, when the senior medical student will metamorphose into a doctor while exercising increasing responsibility (under the direct supervision of a medical school). However, the profession has seemed unwilling to accept this intermediate phase. Instead, the existing pre-registration year, under much criticism for being unsupervised and unaccompanied by any formal teaching, will be kept, with earnest intentions from medical schools to hold a more responsible brief for young doctors in pre-registration posts.

With the coming into force on 20 December 1976 of the medical directives of the European Economic Community (which gives doctors freedom of professional practice in countries in the EEC) the likely loss of manpower through brain-drain becomes greater still. Postgraduate training in Britain is longer than for corresponding specialties in Europe, longer than conceivably can confer the training benefits to be expected from a sub-specialist status. In Britain the average age for obtaining an appointment as a consultant in the National Health Service is 37·5 years.

Discontinuity between medical education and medical practice

Considerable concern attaches to the obvious fact that medical school teaching is in many respects discrepant from the practice setting where doctors function. There are of course continuities between

medical education and the National Health Service, but there are also glaring discontinuities.

In Britain as in many other countries, to varying degree, dissatisfaction has arisen about the accessibility and the quality of health care provided to the community. Few issues in medical education receive more attention currently than the relevance of medical education to the medical services of a country. One attempt to deal with the problem has been directed at the selection procedure.

Doctors are out of touch with the concerns and needs of patients, it has been held, because the doctor's background is excessively different from his patients'. Much research into selection has shown that entrants to medical schools are middle-class, their parents are professional or business people, the entrants are highly intelligent, with a career perspective and a specialty orientation (12). More hopeful evidence was advanced recently in the United States that medical students were changing somewhat to become relatively service-minded, community-oriented, and socially motivated (13); however, there have been subsequent reports to indicate some reversion to 'conservatism'.

Inevitably, health planners—who have the responsibility of ensuring proper medical care now that health has come to be regarded as a right rather than a privilege—have considered whether selection methods should be introduced which will recruit to medicine those future doctors who will be able to meet the medical requirements of communities. In Britain there is no intention for the present to have health services planners dictate to medical schools what qualities should be sought in applicants to medical schools. In Britain intellectual attainment and promise, and not attributes of personality or orientation, still determine almost exclusively who gets into medical school: 'One may therefore summarise the limited aim of the admissions policy as an attempt to admit only those who will graduate at the end of their course' (14). The position is that good test-takers, who did well in school-leaving examinations, are selected for their capacity to be good test-takers when they graduate from medical school.

The evidence points to selection being a more important determinant of the output from medical school than any other component yet studied in detail. The teaching methods used, for example, have not shown to contribute as much. Indeed, careful investigations into the effects of different teaching methods have not

shown that they affect the amount of information learned or the skill acquired; the major impact of varying teaching methods is in the area of students' professional attitudes (15).

According to the 1968 Report of the Royal Commission, in the competition among university faculties for the best students, the medical school does exceptionally well. On an average 14 per cent of university students are medical students. Predominantly they are children of fathers in social classes 1 and 2, more so than the proportion in the general student population (73 per cent as compared to 59 per cent). A fifth of British medical students have medical fathers.

Varied and extensive curriculum changes are occurring in many of the medical schools in Britain (16). Out of the 38 medical schools, 12 are in London, and 3 are new: Nottingham, Southampton, and Leicester. In these schools consideration is being given to a larger intake, to shortening the curriculum, to minimizing the preclinical–clinical split, to the necessity or otherwise of specifying a core curriculum, to elective opportunities, to individual study habits, to the place of self-instructional systems, and to medical school determinants of subsequent career professional choice.

The position of the medical teacher

The importance of the medical school as a social system has become increasingly clear from the sociological studies of medical education reported in the past two decades. The medical teacher acts as a role model, and is a potent influence, but only when teaching staff and students are in good relationship and share in a common purpose. When there is a gulf between teachers and students and the latter go 'underground' to some extent, as was depicted for Kansas in *Boys in White* (17), the efforts of medical teachers to influence students may be counter-productive. Martin has suggested (18) that UK medical schools may be closer to the Kansas pattern than to the more unified pattern of co-operation between staff and students depicted by the Columbia sociologists for Cornell Medical School (19).

Medical teachers do appear to take their educational responsibilities increasingly seriously, and to be ready to be almost, if not quite, as professional about their teaching obligations to students, as about their responsibilities to patients. Courses on teaching are provided for medical teachers by many medical faculties. In Britain a frame

of mind in university teachers which used to find some favour is perhaps best depicted by the reply an Oxford teacher gave, when asked how he spent his time. (In 1969 university teachers were being required to fill in questionnaires to record their half-hourly activities, 8 to midnight, Monday to Sunday, and the Prices and Incomes Board had indicated that university students might express their opinions about the effectiveness of their teachers.) The late Professor Dawkins, Bywater and Sotheby Professor of Byzantine and Modern Greek Language and Literature, answered when interrogated: 'I give an annual lecture—but not every year, mark you!'

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7

Problems in specialty training and distribution in the USA

JACK W. COLE

Problems in specialty training and distribution in the USA

Early in our nation's history, physicians could gain recognition as specialists without investing much time or money. For those seeking such distinction there were essentially three ways of achieving their goal. The most popular approach was to serve an apprenticeship for varying lengths of time with a physician already considered a specialist by the profession. Another avenue was to enrol in courses offered at one of several graduate schools in the United States and Europe. Lastly, physicians could, by limiting their practice to a particular area, eventually acquire such a wealth of experience and knowledge as to be accepted by their colleagues as experts in the field.

A striking feature of specialization in these early days is that it derived mainly from the physician's intellectual curiosity and urge to excel. Undoubtedly the prospect of increased financial rewards influenced their decisions, but it appeared to be secondary to other, more satisfying considerations such as self-esteem and peer recognition.

The routes for achieving specialty status remained essentially unchanged until the beginning of this century. Indeed there were very few specialists, as we know them today, until the 1900s. Most physicians chose to practise as a 'jack-of-all-trades', delivering babies, performing various surgical procedures, treating infections and metabolic diseases, as best they knew how, and providing psychiatric support and counselling to those in need.

Today in the United States it is quite a different story. Except for a handful of general practitioners, almost every physician lays claim to being a specialist of one sort or another. A study published by Levit and her colleagues in 1974 predicted that during the present

decade 'virtually all United States Medical School Graduates will undertake residency training and seek specialty certification' (1).

In 1931, 83 per cent of all practising physicians were general practitioners or part-time specialists; only 17 per cent were full-time specialists. Today it is just the reverse: 23 per cent of all practising physicians are serving as general practitioners or part-time specialists while 77 per cent are full-time specialists (2).

There are now twenty-three formally recognized specialty boards, and there is every reason to expect a further proliferation, although perhaps at a somewhat slower rate.

The explanations offered for this headlong rush toward medical specialization during the 1900s are varied. The most convincing, perhaps, is the rapid increase in medical knowledge and scientific technology that accompanied the tremendous financial support given to medical research during the past few decades. Governmental largesse, of which our medical schools were the principal beneficiaries, created a climate in which research reigned supreme and scientific medicine became the hallmark of medical education in the post-Flexnerian period. Academic advancement, prestige with one's peers and appointments to the staffs of our leading hospitals depended in large measure, and still does to a considerable extent, on research achievements. Seemingly, at times, the more esoteric the research the better. It became impossible during this period for even our brightest and best to thoroughly comprehend all there was to know in even the most restricted disciplines, let alone the broad field of medicine. As a consequence, more and more young physicians sought careers, not to say refuge, in fields such as cardiology, allergy, neonatology, and neurology. An inevitable accompaniment of these expanding intellectual horizons (and narrowing perspectives) were new instruments and techniques, both diagnostic and therapeutic, that gave added impetus to the specialization movement. Renal dialysis, cardiac catheterization, extracorporeal heart pumps, and radioactive isotopes are but a few examples of new technologies that have fostered the need for greater specialization.

The consequences of superspecialization are manifold. Among the most vexing for society has been the depreciation of the medical generalist in our society and the development of a hospital-oriented approach to medical care. The latter phenomenon was further promulgated by the policy of most health insurance carriers, both

private and governmental, to offer minimal cost reimbursements, if any, for medical care rendered in the ambulatory setting.

Within the span of some fifty-plus years, careers in health maintenance and the practice of general medicine are no longer attracting our students, and one's success, however measured, depends on knowing more and more about less and less, having a hospital appointment, and enjoying the emoluments of practising in a relatively limited field.

One of the extraordinary aspects of medical specialization in the United States is that society has not only accepted the movement but, I dare say, encouraged it. The public's reaction has, no doubt, been influenced by the ever-increasing role that the communications media plays in the lives of our citizens. Few nations can claim to be as fully informed, or misinformed (depending on one's point of view), in medical matters, as the United States. Our newspapers, magazines, radio broadcasts, and television screens provide almost daily information on some new diagnostic technique, miracle drug, scientific breakthrough, or life-saving surgical feat. As a result the public's expectations are often as extravagant as the profession's claims, but, more importantly, when they do become ill studies clearly demonstrate that most go in search of a specialist for relief of their self-diagnosed ailment. Bypassing of the primary physician is true for both rural and urban populations. Although it is generally agreed that specialization over-all has been in the public's best interest, our citizens are now, at long last, beginning to express some reservations and concerns about further unrestrained growth.

It is difficult to accurately assess which of the many factors involved account for this growing sense of caution in our society that is currently finding expression through Congress.

The rising cost of medical care is undoubtedly high on the list, and there is little question that specialists and the technologies they employ have contributed to the rapid escalation of these costs. Adverse public reaction has been accentuated by our nation's most recent economic downturn.

Lack of easy access to medical care has also contributed to the growing disenchantment between the laity and the physician. As the number of physicians entering the specialty ranks has swelled there has been a concomitant reduction in the number of general practitioners prepared to manage the day-to-day medical needs of the American family. House calls and evening and weekend office hours

are all but extinct. Specialists may be as unavailable as the generalist, even in areas where a surfeit may exist, for a somewhat different set of reasons—one being the 'idleness of affluence'. As the profession continues to be reimbursed, in the main, on a fee-for-service basis, many specialists are able to generate sufficient income to permit a significant reduction in their work week. This is particularly true where state and national tax requirements are such as to render additional service beyond a particular point profitless.

Other, perhaps more subtle, reasons why the public views further specialization with increasing concern include the many moral and ethical issues that are derivatives of such highly publicized activities as organ transplantation and the imprudent use of sophisticated life-support systems in the dying patient, to mention but two. In short, the fruits of scientific 'advances' and superspecialization in medicine have created additional anxieties in the minds of many that are already boggled by walks on the moon, the waste of war, and the loss of integrity in government.

If it is true that the profession has been unmindful of rising medical care costs, insensitive to the public's lack of ready access to medical care, and overly zealous in the application of new technologies, it has worked diligently at maintaining high standards of quality care within the specialty ranks.

Since the first specialty board in ophthalmology was established in 1916, the watchword has been *quality* control. The credit for this clearly rests with the profession. Over the last seventy-five years the effort to protect the public from unqualified specialists has been unending and as successful, in my view, as can be expected of most any human endeavours. This pursuit of excellence through self-monitoring has led to a rather elaborate system of examinations and review processes.

An institution seeking to qualify as an accredited graduate training programme in a specialty field must first submit the appropriate request to a residency review committee. Each specialty has such a residency review committee and, while each committee is constituted somewhat differently, they consist, in general, of a group of highly qualified individuals with the responsibility to determine if the institution has sufficient resources, both physical and personal, and an adequate patient volume to provide a satisfactory setting for the education of physicians seeking qualification in a specialty field. If after a thorough investigation, which entails an on-site inspection

by representatives of the residency review committee, the committee votes to approve the request of the applicant institution, their action is then forwarded to the Liaison Committee on Graduate Education. This body includes representatives of the American Medical Association, American Hospital Association, Association of American Medical Colleges, Council on Medical Specialty Societies, the American Board of Medical Specialties, the Federal Government, and one public member. It was created as a subsidiary committee of the Co-ordinating Council on Medical Education, and it grants final accreditation.

This accreditation process is repeated periodically, usually every three years, for all programmes in specialty education.

Physicians seeking specialty certification must complete their training in an accredited programme, following which they must successfully pass one or more examinations, depending on individual specialty board requirements, and provide supporting documents of their moral and ethical integrity. In some specialties a period of practice is also required.

A more recent effort at quality control within the various specialties has been the endorsement of periodic recertification. Since 1974 all twenty-three specialty boards have favoured the concept of recertification. Although this is voluntary at the present time for diplomates of most boards, it is mandatory for diplomates of the American Board of Family Practice, and will no doubt become so for diplomates of the American Board of Surgery within the next few years. It is expected that other specialty boards will follow suit.

Inasmuch as programme accreditation and specialty certification are voluntary, they do not of course preclude a duly state-licensed physician from working in a specialty field. However, board certification has essentially become *de facto* a requirement for medical practice. Admitting privileges to hospitals, academic advancement, and fee schedules are increasingly linked to specialty board certification.

These efforts at providing quality control by the specialties notwithstanding the current national goal remains to once again restore the primary care physician to a position of primacy in our health care system.

In order to realize this goal at least two major problems must be solved. The first is how do we control the numbers and types of specialties? The second is how do we restore a lasting and genuine

interest among tomorrow's physicians in the practice of family medicine?

Controlling the numbers, types, and distribution of various medical specialists in a democratic society, which is at the moment devoid of any long-range health policy, is a Herculean task. There has never been a serious attempt to relate the education of specialists to the national need. We have long operated under a policy of *laissez faire*, without any effort to infringe on the young physician's right to enter the specialty of his choosing and to practice in the community of his choice. All that has ever been required is that he acquire the necessary education in an approved graduate programme, pass the examinations for specialty certification, and obtain a state licence. The federal government, the individual certifying specialty boards, and the state licensing agencies have never seen fit to interfere in the process of career choice or geographic distribution. Presumably, the law of supply and demand, which is the very essence of our capitalist society, and one that has served industry and commerce reasonably well during the past 200 years, was expected to correct any major perturbations in specialty numbers or the locations in which physicians ultimately decided to practise. To a large extent, this has worked reasonably well. However, there is evidence to suggest that we may now have an excess in certain specialties, and that some regulatory mechanism should be devised to restore the numerical imbalances in the types of specialists and influence their distribution according to need.

Several agencies, both public and private, have addressed this issue in the recent past. Among them has been the Josiah Macy Jr Foundation with its *Report of the Commission on Physicians for the Future* (3), the Institute of Medicine report on *Social Security Studies*, the *Study on Surgical Services in the United States* (4), supported by the American Surgical Association and the American College of Surgeons, and a study on health manpower currently in progress by the General Accounting Office of the United States Congress. Numerous other studies are being, or have been, conducted by individual specialty groups to ascertain manpower needs within their particular fields.

While these studies tend to emphasize different aspects of the problem, there is general agreement that top priority be assigned to the training of more primary care physicians.

Although the terminology at times became somewhat confusing,

basically the primary care physicians or physicians of first contact, if you will, include general internists, general paediatricians, and the newcomers, the family physicians. This last group was formalized as a specialty in 1969. Currently, certification by the Board of Family Practice requires three years of training, following graduation from medical school, in an accredited programme of which there are now 232. It is reasonable to assume that the specialties of internal medicine and general paediatrics will respond to the stated national need by simply continuing their time-tested educational programmes with only minor modifications in their content. It is the new specialty of family practice, on which so much attention is currently focused, that will undoubtedly experience difficulty in becoming firmly established in the fabric of our medical education system.

Although several medical schools have established departments, divisions, or sections of family practice, what is frequently lacking is a sufficient number of well-qualified faculty to serve as 'role models' for students during their undergraduate days. Several studies suggest that one of the most important factors influencing career choice is faculty-student interaction.

Furthermore, there is often a lack of clear definition of what the specialty of family practice encompasses and, as a result, certain conflicts of interest have arisen between traditional programmes in internal medicine and pediatrics.

A more subtle difficulty attendant on the emergence of the specialty of family practice has been in gaining the universal respect of the academic community which has been so thoroughly steeped in the rigours of scientific medicine as to look with disdain on those physicians who purport to care for an entire family's health, consisting as it frequently does of self-limiting illnesses or inconsequential complaints.

In spite of these and other barriers the specialty of family practice appears to be gaining strength. Certainly, all primary care specialties are currently in vogue with our students. Recent data from the National Intern and Resident Matching Program indicates that in 1974 only 39 per cent of students entering the matching programme chose primary care specialties compared with 51 per cent in 1976 (5). If we include obstetrics and gynaecology as a primary care specialty, the percentages go from 42 per cent in 1974 to 56 per cent in 1976.

Actually, 'recruiting' efforts in the primary care specialties has probably been too successful and the nation is now confronted with

the fact that we will soon be unable to provide a sufficient number of accredited programmes in primary care to accommodate the large and rapid influx of applicants.

The concern of many medical educators who champion the primary care movement, is whether students will remain as primary care physicians or, with the passage of time, will elect to enter one of the many subspecialties in medicine. Even within the recent past, not all students embarking on careers in the primary care specialties maintained their commitment to the field. The American Board of Internal Medicine reports that 42 per cent of the students who received their primary certification in 1972 sought certificates of special competence in a subspecialty area in 1974. The American Board of Pediatrics observed that of the 600 candidates sitting for their oral examination in 1975, 8 per cent had taken one year of subspecialty training and 8·5 per cent had received two years in subspecialty training. It should be noted, however, that internists and paediatricians with competence in a subspecialty do not usually restrict their practice exclusively to the subspecialty area, and many, if not most, continue to provide broad patient care coverage.

At the moment, therefore, the primary care specialties are on the ascendancy in the United States and other major specialties have begun or will soon begin to plateau.

If this is true, it is in part a reflection of the expanding presence of government in the health care field. The thrust of current government activity in the United States is clearly on the side of increasing the number of primary care physicians.

Few events have created as much unrest among medical educators during the past several years as the congressional efforts to manipulate the specialty mix in the United States through various financial incentives.

In the recently passed Health Professions Educational Assistance Act of 1976 (Public Law 94–484), medical schools, to qualify for capitation grants, must have 35 per cent of the total number of filled first-year residency positions in the United States in 1977 in primary care specialties. This increases to 40 per cent in 1978, and to 50 per cent in succeeding years.

The most onerous aspects of the legislation, at least among the private institutions, is the further intrusion of government into the educational process, and the fact that medical schools are being used as instruments to effect social reform. These and other objections

have fallen on deaf ears because of the very practical and cogent argument that the government is continuing to assume a greater percentage of the total health care bill and, therefore, has a right to intervene. Furthermore, many politicians believe that this course of action is in the public interest.

This latter point warrants careful examination. Serious questions must be raised regarding any long-term benefits to be derived from programmes that are based almost entirely on monetary inducements, without due consideration of what motivates our students to enter specialty fields. Although research on this very important question has been limited, the available data suggest that financial gain is not the major reason for students entering specialty fields. This may be explained in part by the fact that the income from most specialties, including family practice, is sufficiently high, and the differential between specialties so slight, as to be insignificant in the students' ultimate decision. Furthermore, the income of residents has increased considerably during the past twenty years, which in effect has minimized the individual's accrued indebtedness, thereby blunting the lure of large incomes on completion of their training.

Other factors which appear to be more important in career choices include faculty role models (previously alluded to), various experiences during the period of graduate education, and individual personality traits. Thus the cumulative evidence suggests to this observer that the best opportunity to influence more students to choose careers in family practice is to develop an inspirational faculty who, by their example, can convince the verdant physician that family medicine can be a challenging, gratifying, and intellectually stimulating professional pursuit—not, I submit, by coercing our schools or perverting the purchasing power of the American dollar by trying to buy the minds of our students.

Another and perhaps even more unsettling issue for those attempting to regulate specialty training is the lack of data relating to the question of need.

We have yet to devise satisfactory methods for obtaining valid information on such important issues as a practitioner's productivity. How many surgical procedures should a neurosurgeon perform annually to prevent his skills from becoming atrophic because of an inadequate number, or careless and hurried by an overabundance? Are we sufficiently secure regarding the efficacy of various medical therapeutic regimens to be able to state without significant

reservation that a precise number of specialists are required to cope with a particular health problem such as mental illness? One need only to think for a moment of the vast number of cases of gnarled joints and disabled arthritics who might be rehabilitated by a qualified orthopaedist's intervention to appreciate the magnitude of the problem in trying to establish specialty quotas. How do we ascertain with confidence which of the many illnesses or infirmities of man should come under the care of this or that specialist? Those of us in the surgical field know all too well of the many internecine battles that have been waged over whether the neurosurgeon or the orthopaedist is better able to care for the patient with a herniated intervertebral disc. Should a patient with cancer of the mouth be managed by a plastic surgeon, an otolaryngologist, a radiotherapist, a chemotherapist, or a general surgeon?

In brief, can a satisfactory solution to these ageless problems of professional territorialism be resolved by legislative fiat in a way that will avoid doing violence to morale in our specialty ranks, while at the same time optimize the care of those in need and, in so doing, avoid depriving patients of their freedom of choice?

Some would suggest that a partial answer to the question of specialty numbers will come through the gradual expansion of prepaid health plans. One comparative analysis, however, makes it clear that this type of practice arrangement is by no means a panacea in determining the numbers of requisite specialists per population in a particular field.

In one study, using Massachusetts as the reference state (2), it was found that several organized health plans, including the British National Health Service, would have had fewer specialists employed. However, between the National Health Service and the Group Health Plan in Washington, DC, there was a ninefold difference in the number of paediatricians employed and a fourfold difference in the number of psychiatrists. There was a fourfold difference in the number of internists between the Puget Sound Health Plan and Washington, DC, Health Plan. These discrepancies make clear the difficulties in detailing the allocation of specialists, even in organized health plans where the populations served tend to be fairly homogeneous.

Accepting, as most health planners do, the need to introduce some regulatory mechanism over the type and number of specialists, this remains just one facet of the problem. It is inextricably linked with

physician distribution. To my mind, any effort, however well-intentioned, to dictatorially determine where a physician practises poses a far greater threat to the health care profession than attempts to regulate numbers—it strikes at the very heart of those elements we deem important in a free and democratic society.

No nation has dealt with this problem effectively, except perhaps those with totalitarian governments. In the United States it is generally held that some of our rural areas and certain inner city ghettos are medically underserved. The deficiencies occur principally in the number of primary care physicians.

The factors that determine where a physician locates his practice are highly varied. It is noteworthy, however, that, again, income is not as important as has been assumed according to several studies (6). Factors that weigh more heavily in this decision include his personal background (those coming from rural settings are more apt to settle in rural areas), social and cultural advantages, educational opportunities, not only for family members but also for the physician himself, access to hospital beds, and where he obtained his graduate education. Regarding this last point it has been shown that a physician is more likely to remain in an area where he spent his time in residency than where he received his undergraduate education.

As one might expect, those specialties requiring sophisticated technology (i.e. surgery, radiology) will perforce locate in communities that provide the necessary facilities. The Hill-Burton legislation of a few years ago, which subsidized construction of small hospitals throughout the United States, accounts for the fact that there is a reasonably equitable distribution of surgeons throughout the land, according to the recent SOSSUS study (4).

Other specialties, including internal medicine, seem to have done less well.

Several newly created medical schools in close proximity to some underserved areas may be expected to have a salutary effect on specialty distribution, but the full impact of this will not be appreciated for several years.

It is obvious that there are no simple answers to the many questions raised in any discussion concerning numbers, types, and distribution of specialists in the United States. Those who have spent any time reviewing the complexities of the subject will be the first to admit that the only persons who do not appear to be confused are those who are not fully informed.

Specialization is destined to be an integral part of the medical profession, as long as men and women are free to think, explore, and undertake to modify their environment. If politicians attempt to curb or curtail the process with heavy-handed legislation, the society they profess to serve will, ultimately, be the loser.

It remains to be seen whether the private sector can act in concert and with sufficient dispatch to develop a mechanism for matching public needs to professional output. The aforementioned Macy report (3) and the IOM report (2), have recommended the establishment of a quasi-public national commission to undertake this task. As Rosemary Stevens points out in her excellent book, *American Medicine and the Public Interest* (7), 'the hour is late'.

The public clamour for specialists in family medicine is not without some justification, but my perception of the government's response has led me to conclude that we may well have set the stage for something of a Pyrrhic victory.

We have increased the number of medical schools, expanded enrolments, many young Americans are enrolled in medical schools abroad, and most colleges report an all-time high in premedical-oriented students. At the present pace I foresee a plethora of practitioners in the near future, educated at considerable expense, disgruntled in many instances because they are overtrained for the care they must eventually provide, and having little effect on the health of our people which in the minds of many observers is in greater jeopardy, more by our life-style—over-eating, alcoholic abuse, smoking, driving cars too fast, inadequate housing, poor sanitation, and sedentary lives—than by any lack of physicians.

For my part, I would hold with those who see greater support for the various so-called physician extenders as a wiser course of action.

Physicians' assistants, nurse practitioners, social workers, nurse clinicians, and numerous other allied health professionals have clearly demonstrated their capacity to provide high-quality care with physician supervision. Furthermore, they can be educated at less cost, in less time, and, if recruited from areas where they may be expected to serve, can assume their professional responsibilities with a minimum of social adjustment and family disruption. But that is another story.

Unquestionably there is cause for concern in the United States today when a noble profession such as medicine becomes estranged from the society it serves and gives evidence, both real and imagined,

of having abandoned its role of caring for the sick, the injured, the aged, and the infirm. A profession that has to varying degrees become mesmerized by evanescent technologies and devalued the 'art of medicine' will surely be judged harshly by the multitudes who turn to it for help in time of need.

The challenge is clear. Specialists in the health care field must begin anew with a 'declaration of interdependence' and, once valid data regarding public health needs are available, medical education must develop a mechanism for affecting a proper fit between those needs and the appropriate health care providers.

Of equal concern is the society where self-reliance and respect for individual freedom has atrophied to the point that the solutions to any and all problems are sought through governmental intervention.

We must strive to restore in our citizens those attributes of individual responsibility and self-determination that have been sorely eroded over the last two hundred years, and as a nation redirect our energies toward correcting certain societal ills rather than engaging in the enervating efforts of revamping the medical profession.

Lastly, our government, in turn, must forever be reminded of its obligation to serve rather than rule the society it represents, and be ever-sensitive to the prospect that hastily fashioned remedies for our health care problems may prove more harmful than the disease.

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8

The growth of specialization in Scotland

GEORGE D. FORWELL

The growth of specialization in Scotland

It is appropriate now to review the growth and present state of medical specialization in Scotland. Although the 1974 administrative reorganization of the National Health Service was not associated with any change in the medical staffing structure as regards general practitioners or hospital-based doctors, it created new integrated central and area administrative bodies likely to make a general review of medical care with implications for at least the geographic distribution of NHS resources.

Rosemary Stevens (1) has given a definitive historical account of the combination of professional and other factors which has led to the existing pattern of specialization by doctors in Britain. The Royal Commission on Medical Education (2) implicitly decided that all medical undergraduates should be educated to the same basic scientific standards and expectations. In the last decade there has been further development of the role in postgraduate medical education of individual Royal Colleges and Faculties and of their joint activities, for example, as regards joint higher training committees.

The major types of specialization of medical practice are reflected in the NHS medical staffing structure. It is generally accepted today that every doctor requires specialist postgraduate education, including the prospective general practitioner as a specialist generalist. The structure of the 1948 NHS continued and deepened the pre-existing specialization, after hospital-based training grade posts, into three types of medical career: general practitioner, consultant, and public health doctor. Indeed, from 1948 the distinction between these three careers became such that doctors concentrated their career grade employment in only one of the three parts of the 1948

NHS. The emphasis of the present paper is on specialization as a consultant and on its relationship to medical care rather than teaching and research.

As regards consultants, the 'catchment population' varies with the specialty because some or all of the population resident in one area may be referred to consultants based in another area, even for the 'district general hospital' function but especially for more highly specialized services ('regional function' and 'reference function'). For example, in 1974, 23 per cent of all in-patients discharged from other than maternity and mental hospitals within the Greater Glasgow area had home addresses outside Greater Glasgow; this over-all 23 per cent varied from 64 per cent in radiotherapy to 5 per cent as regards geriatric assessment. A study for the purpose of the present paper, also in Glasgow, quantified the visits by consultants to other areas and the visits by consultants from the other areas to the Glasgow teaching hospitals; these inter-area movements of consultants, although important, were found to be relatively few. Although, in terms of consultant sessions, they approximately cancelled each other out numerically, the purpose of these movements differed: the Glasgow consultants visited to care for patients whereas the other consultants came to Glasgow predominantly for other than direct patient care.

The growth and, in particular, the distribution of consultant specialization in Scotland has been determined by factors other than the NHS, notably local market size and the existence and location of medical schools. Specialization by doctors is usually said to flow from increased scientific knowledge, and the resulting variety of skills which encourage a doctor to limit himself to a smaller and smaller part of the whole. However, for the economist (3), specialization is a function of the scale of the enterprise or market, ie catchment population. As the population becomes more concentrated, as transportation improves for both patients and doctors, and as more patients are concentrated in hospitals, increasing numbers of doctors can occupy themselves fully while restricting their type of patients. With a practice limited in this way, they gain increased knowledge through deeper explorations into particular diseases and techniques. Thus, according to Hiestand, specialization is the source of increased knowledge, not the result. He presents no data or other evidence for this conclusion. Although it is impossible anywhere from the data in the present paper to differentiate between cause and

effect, Hiestand's conclusion provides a convenient simplification or, rather, oversimplification.

The health board areas in which are located the four clinical medical school centres have higher total numbers of specialties recognized, more consultant sessions and other resources than would have been expected from their populations or, in the case of Edinburgh and Glasgow, their catchment populations. Data are not available for the allocation between medical care, teaching, and research of either consultants or honorary consultants sessions.

The effect of these two factors, market size and teaching medical centres, is compounded by that of other factors. The presence of more doctors in turn stimulates activity in health services. In the USA, Bunker has given evidence that the volume of surgery performed is proportional to the prevalence of surgeons (4) and the incidence of surgical procedures has been predicted with some accuracy by the numbers of surgeons and beds (5). However, 'workload' cannot be equated with numbers. Hopkin has shown that over the past ten years the numbers of new out-patients seen per consultant in England has declined in virtually every specialty (median percentage decline 29 per cent) (6). Similarly, in the last decade, despite 30 per cent more consultants and hospital-based medical staff in Glasgow, there have been no increases in new hospital out-patients seen or in-patients discharged; the total number of bed days has fallen slightly. Hopefully, the quality of care of patients today has improved, in addition to increased time spent in teaching and research which should improve the care of future patients. The growth and relative growth of particular consultant specialties is closely related to their evaluation, especially by the corporate medical profession. This esteem differs between countries. Bull presents evidence that radiodiagnosis is valued relatively more in Sweden than in Britain and lists changes which he considers would alter the attitude of doctors in Britain to radiodiagnosis (7).

Analyses of the growth of specialization in other developed countries would be likely to show the operation of all these factors. It is impossible to predict what would have been the difference in the growth of specialization in Scotland in the absence of the NHS. Although the NHS was introduced for socio-economic reasons remote from medicine itself, Aneurin Bevan gave the financing of specialist hospital care as one of its two prime aims. The existence

and structure of the NHS from 1948 to 1974 did have its influence on medical specialization along with the other factors.

(*a*) The separate administration of the general medical practitioner service, and hospital and specialist service militated against the holding of career-grade posts in more than one service by the same doctor.

(*b*) Control of the number of consultant posts prevented so many doctors becoming consultants as to threaten the survival of general medical practice. Despite this control, in Scotland there has been a steady rise in the numbers of consultant posts and, in consequence, in the proportion of consultants to general practitioners. However, the number of general practitioners (principals) has actually increased (although the number of medical assistants to general practitioners has decreased from 274 in 1950 to less than 50 in 1975).

Scotland	*1950*	*1955*	*1960*	*1965*	*1970*	*1975*
General practitioners	2,387	2,503	2,665	2,618	2,631	2,797
Consultants	686	876	1,037	1,290	1,559	1,708

Doctors qualifying overseas have been available in considerable numbers to provide additional general practitioners and candidates for consultant, and in particular, for supporting hospital medical staff posts (8). It has been mentioned above that, when compared with their areas and catchment populations, the four areas with clinical medical schools have considerably more consultants and other hospital doctors than the mean for Scotland. The same effect is seen only to a limited extent as regards general practitioners.

(*c*) When compared with health care in other countries, perhaps the cardinal feature of the NHS is the closed hospital system and the interposition of the community-based general practitioner between patient and the hospital-based consultant. In some situations, notably accident and emergency (9), there are growing exceptions to this generalization. However, this pattern of organization is essential to the existence of specialization as a consultant and, within consultants, affords the opportunity to achieve higher degrees of consultant specialization (for example, extending to consultants who see patients only by reference from other consultants). In addition it is likely that the existence of the general practitioner as part physician, part paediatrician, and part obstetrician has influenced the proportions of consultants between these and other specialties (1).

(*d*) As mentioned above, planning of consultant specialization in Scotland between 1948 and 1974 was dependent on the direction of candidates for consultant posts by control, largely by the former regional hospital boards, of the location, number, and specialty of consultant posts. That this control has had by 1974 a considerable effect on distribution of consultants is apparent when it is recognized that before 1948 there was a complete absence of wholly hospital-based specialties from a few of the new health board areas. One of the greatest achievements of the NHS has been the upgrading of the standards of peripheral hospital and specialist services outside medical centres (10).

(*e*) There tends to be a relative mismatch by specialty between the specialties preferred by aspirants for consultant posts and the specialties of posts the NHS considers it requires. Control of the location and specialty of consultant posts has prevented a higher number or proportion of consultants in specialties more popular with doctors, notably general medicine, general surgery, and obstetrics and gynaecology. This control has encouraged the emigration, especially to North America, of some doctors who wished to have a hospital-based career (11, 12). However, it probably has helped indirectly to enable the rise in consultant numbers in less popular specialties, for example, anaesthetics, geriatric medicine, laboratory medicine, and radiology. Indeed, the greater the total number of consultant specialties recognized and the more the consultant staffing (in absolute numbers or in population ratios), the greater the proportion of sessions by all consultants combined which are in anaesthetics, laboratory medicine, and radiodiagnosis and radiotherapy. This proportion has risen also with time: in 1949, 24 per cent of consultants were in these specialties, and 30 per cent by 1975.

(*f*) The total number of consultant specialties recognized has risen especially in the last decade. For example, in Greater Glasgow: *1950*, 22; *1955*, 24; *1960*, 25; *1965*, 29; *1970*, 34; *1975*, 40.

(*g*) In the absence of the NHS, it is doubtful whether there would have developed some types of consultant specialization, for example geriatric medicine as that branch of general medicine concerned with the clinical, preventive, remedial, and social aspects of health and disease in the elderly (13). As such, geriatric medicine has vital links not only with general medicine but with general practice and a variety of paramedical social services. Indeed, it is not so much a

specialty as co-ordinated general medicine applied to a limited age-group. It has been suggested that other specialties should follow geriatric medicine and combine preventive measures with therapy and rehabilitation and temper all the consideration of the total environment (social, economic, and psychological) of the individual patient (14).

(*h*) Areas which have highly specialized consultants also have higher consultant staffing ratios than other areas in the more 'general' consultant specialty categories. In the larger centres, for example, consultant posts in general medicine have not been discarded progressively in favour of posts in cardiology, neurology, etc.; the more highly specialized posts are additional to the more general ones. In consequence, for example, although the total number of consultant specialties recognized in Greater Glasgow is 40 and only 25 in Lanarkshire, 92 per cent of the consultant posts in Greater Glasgow are in the 25 specialties recognized in Lanarkshire.

(*i*) In Scottish areas, as with the former English hospital regions (15, 16), the variation between areas in consultant numbers is greater than in bed numbers. Related to this is that, on average, a general physician in Glasgow has available 21 beds, general surgeon, 25, and an orthopaedic surgeon, 32; the corresponding ratios for the five other areas in the former Western Region are general physician, 41, general surgeon, 40, and orthopaedic surgeon, 38.

It is regarded by many as axiomatic that specialization leads to higher quality of services. The present paper, in the absence of patient care outcome data, can give no evidence whether, in Scotland, more highly specialized consultants do achieve higher standards of care. This may be true, but is difficult to demonstrate from the routine statistics. However, an example is presented by Argyrou and his colleagues (17) from the NHS in England where many prostatectomies are carried out by general surgeons, and, in Canada, as regards hernia by Iles (18). Argyrou found that in urological units in three parts of England transurethral prostatectomy required a hospital stay at least one week shorter than open Millin or transvesical prostatectomy. By making transurethral resection more widely available there could be a considerable saving; but more surgeons would require training in urology.

Brockington has pointed out that since in developed countries much of the existing work for the doctor concerns chronic physical

and mental disease, specialization by doctors is of more limited significance for man's total needs for medical care than might be imagined (19). Indeed, a lack of relationship between health and availability of specialized health services is becoming recognized (20, 21). Valid international comparisons are difficult to make, but mortality statistics are worse in Scotland than, for example, in England (22) despite relatively more doctors, especially consultants, in Scotland. The present paper does not consider the distribution of doctors in Scotland in relation to mortality, morbidity, or social deprivation. However, it will be recognized that while the inverse care law (23) does apply in some areas (notably Lanarkshire), it does not apply throughout Scotland in that within the cities there are based more rather than fewer general practitioners and, especially, consultants, than the average for Scotland.

Specialization does have its disadvantages (24). It may impair flexibility of health services by making adaptation to scientific, technological, or social change sometimes less easy. Scientific advance does not necessarily fit into the boundaries of existing specialties, and effort may be wasted because of boundary disputes and vested interest. A price paid for the enhanced skill of the specialist is some loss of flexibility. Another price paid is the need to man every specialty with consultants and their replacements (25). In the NHS the precise actuarial relationship of senior hospital-based training posts (senior registrars) to expected vacancies in consultant posts progressively has become an essential point of consultant manpower planning in the NHS. The restriction, for educational reasons, of these posts to the areas of four medical school centres adds considerably to the staff of these areas. Specialization by more junior hospital-based doctors who cannot all become consultants is another problem (26). The more sophisticated the specialty, the greater tends to be the need for specialized supporting medical pairs-of-hands.

Although, in general, the number of consultant specialties is increasing, since specialization is a dynamic process, some specialties may diminish in appropriateness. For example, with changes in disease prevalence, the consultant specialties of chest medicine (27), and infectious diseases (28) are changing and, in part, becoming absorbed into general medicine and paediatrics. Specialties based on a technology may disappear entirely; this could occur to radiotherapy should a new form of effective treatment for cancer be introduced.

Not all specialties emerge because of increase in volume and complexity of scientific knowledge and technological advance in relation to medicine. The types and degree of specialization of medical practice are related in part to the health services structure. In Britain, geriatric medicine has emerged as a specialty in consequence of social as well as demographic change.

In Scotland, a country with total population and size of Indiana, ease of transport between populous areas should facilitate the planning on a national basis of health services in general, and, as regards the present paper, in particular of consultant specialization and its distribution.

Medical manpower planning is a facet of, and inextricably linked to, general health service planning (29). To a limited extent, national consultant manpower planning has been recognized since the establishment in 1962 of the Advisory Committee on Hospital Medical Establishments following the Platt Report (30). However, until 1974, there was a tendency for regional planning to predominate with, as seen in national terms, an outcome perhaps little better than in other aspects of NHS planning and classified by Maddox (31) as illustrative of 'muddling through' (32). It is perhaps only fair to mention that, since 1974, progress has been made at national level as regards some specialties, for example, cardiothoracic surgery.

If a high degree of specialization is a boon in terms of medical care, to what extent is its restriction to medical school centres justifiable? Concentration may enable the efficient use of supporting staff and investigative and treatment facilities. Using regression analysis, Feldstein (33) showed that there are economies of scale in British hospitals, but with a turning point at 300 or 900 beds depending on how the statistical results are interpreted. It is frequently argued that there are advantages for patients if doctors in one specialty can readily consult doctors in other specialties who are also on the same site.

The more technology expands the scope of diagnostic and therapeutic interventions, the more technologically dependent the consultant becomes; he is no longer self-sufficient (34). Restriction of specialist posts may be necessary to afford individual consultants the opportunity to gain further knowledge by caring for adequate numbers of patients with relatively rare diseases (for example, childhood leukaemia). However, this concentration increases travel problems for patients and in England it has been argued it would be as

effective to improve treatment regimens at local hospitals as to attempt to concentrate care at a few centres (35).

One of the main points about a high degree of consultant specialization is that it is associated, although not demonstrably as cause and effect, with a cluster of associated features which together constitute a very expensive component of the NHS, other major components of this expenditure being high population ratios of other hospital-based staff and of resources, and of the use of them, for example, hospital beds and admission and discharges. Opit and Cross (36, 37, 38) have contended that expenditure on therapeutic services is a direct function of expenditure on clinical staff. Subsequently, Opit and Day (16) largely validated the hypothesis by showing the expenditure on therapeutic services by ophthalmologists was a function of the number of medical staff in ophthalmology.

If specialization is a boon because the specialist produces a higher standard of patient care, and that more quickly, to what extent are the other features (for example, hospital beds) necessary concomitants to enable this standard to be achieved and maintained? Perhaps more NHS planning attention should be paid to determining what is the most effective 'mix' between, in the present context, consultants, on the one hand, and other staff and equipment and buildings on the other.

Partly with the logical aim of enabling community services to be developed more rapidly, at a time when, primarily for financial reasons, NHS expansion is being diminished, the Secretary of State for Scotland (39) recently advocated a reduced rate of expansion of acute services. Related to this, he emphasizes continued efforts will have to be made to ensure that the ratio of acute (ie short stay) beds does not exceed 2·5 per 1,000 population, or 3 per 1,000 population where highly specialized facilities are provided on a regional or national basis. To achieve these norms, in some areas considerable reductions in acute bed numbers are required, in part to allow for future population projections.

Theoretically, in terms of equal treatment or at least equal opportunity for treatment, the only equitable basis for the distribution of specialist posts and of other health service resources (for example, hospital beds) is on an area population basis. This is to be reconciled with the allocation of funds and of specialized posts on a sufficiently large population basis to enable wide scope for centres providing highly specialized services, and to meet the particular needs of

undergraduate medical centres. Were specialization a consequence of increased scientific knowledge, it might be expected to develop without much conscious planning effort as a process of strategic choice. However, it has been suggested above that specialization, at least in high degree, is a function of the scale of the market. As NHS planning, especially at national level, becomes more effective the market scale should become more a deliberate consequence of planning. Part of this process should be the planning of specialization.

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9

The doctor and resource allocation

DONALD McINTOSH

The doctor and resource allocation

I have attempted in this paper to indicate my own experience of the local scene in regard to resource allocation over the forty years which have elapsed since I qualified in medicine. I have to accept therefore that the outlook may be parochial and that forty years is about one-sixth of 250. It is, however, forty years of great change in medicine and surgery and one here of fundamental changes in management. During this time indeed there have been three succeeding forms of institutional management, each with a different mechanism for obtaining the help of doctors in allocating resources.

The suggestion for establishing the Royal Infirmary as a new hospital for the sick poor came from John Munro in 1721 and the successful appeal for its foundation came four years later. From this there developed the largest voluntary hospital of the day under the Managers who continued in existence until 1948 when they were replaced by the Board of Management under the National Health Service. The Board, in its turn, disappeared with the reorganization of the NHS some three years ago.

Table 1 in the paper shows the financial implications of the changes in the resources available and perhaps also of the growth of specialization. The cost per week of patient care has increased by a factor of eighty while the cost of living index has increased by a factor of eight. I have attempted briefly to outline the changes in management patterns, and the differing ways in which doctors, and especially doctors actually on the staff of the hospital, were invited to help, either directly in management, or indirectly in offering advice, in the allocation of resources at a microeconomic level.

Changes in the persona of management followed nationalization which was also responsible for the change from a charitable

organization to an arena of considerable political importance. Doctors coincidentally came to play a larger part in management and in consultation about priorities.

One difficulty was that doctors were called upon as experts to offer advice but were not always able completely to discard their own interests in their field of expertise. Such difficulties have been discerned over the longer period. John Knox is credited with authorship of the prayer with which the College of Surgeons opens all its meetings. The prayer includes a request that 'being convenit to deal with matters concerning the weal of our vocation we may be purged of all grudge, malice, and partiality'. Four hundred years of consistent prayer has abolished grudge and malice in these matters with a sufficient overflow of benison to deal with each in other medical organizations in the area. I have however felt from time to time that small islets of partiality in regard to resource allocation have proved resistant even to John Knox in Edinburgh.

It will be seen that one of the changes consequent upon the recent reorganization has been to diminish the number of doctors engaged in a managerial role, perhaps to a proportion more akin to that of the old charitable institutions. At the same time the number and variety of doctors in an advisory role has been greatly increased. At some levels their influence may also have been increased.

It would be idle to pretend that there is not considerable criticism of these arrangements—in part from those who feel their role diminished under the new dispensation—and in part from those who might have been expected to benefit had the times been other than calling for advice about retrenchment rather than advice about brave new allocations of resources.

Historically it can be seen that some at least of the holy cows worshipped by academic and service staff, senior and junior, are merely lusty post-nationalization calves lacking Brahman authority.

I have drawn attention to the ways in which doctors in the course of patient care can preempt resources—on occasion probably of a considerable value.

I have indicated possibilities for the future. My belief is that continuing disinterested presentation of feedback is the most potent stimulus to good decision-taking by doctors . . . and before offering advice doctors must come to clear decisions amongst themselves. Equally I see the necessity for good and reputable financial advice to be available to doctors who do not, in my book, enjoy high repute

for numeracy. Clearly enunciated warnings about the financial facts of life will also be helpful to good decision taking about the best use of resources.

I have made the point about the necessity of savings accruing to the savers. I would accept that sanctions of one kind or another would have to be available to deal with the overspenders.

Without these disciplines doctors will continue to make decisions at the best on pragmatic cost-benefit assessment and at worst on emotion, self or herd interest, or occasionally based on the transference of passion aroused by some resented decision of authority on an unconnected matter.

On the subject of disciplines I should perhaps make the point that I have been sorry to see, under the new dispensation, the abrogation of any authoritative stance by doctors as officers at hospital level—but this is perhaps moving from my brief. Nevertheless the medical superintendent in the past was a potent neutral force in facing individuals in any station of hospital life with their folly in some profligacy of resource using.

It remains to be seen how macroeconomic decisions will be influenced by doctors' advice at national level where the sometimes conflicting claims of medicine, social ills, and political realities must finally be decided. Time and money have both been too short to do more than hazard a guess at this level.

A backward glance at resources and their allocation cannot be out of place. Before 1948 the cost of the hospital services in the Lothian part of the South-Eastern Region of Scotland was of the order of £4·5 million. Today the Lothian area alone has a hospital budget of £70 million. Comparative figures for the Royal Infirmary of Edinburgh are shown in Table 1 (COL Index 1936 = 100; 1976 = 787).

This 'Health Care Cost Explosion' has occurred to a greater or less extent throughout the world and has been the subject of a Henry

Table 1. *Royal Infirmary of Edinburgh: in-patients*

	1936	*1976*
Beds	1,014	986
Average daily occupied beds	965	865
Number of patients discharged	20,612	30,619
Average duration of stay	17 days	10 days
Cost per case	£6·80	£308·70
Cost per week	£2·77	£215·72

Dunant Institute symposium (1). It is not apparently related to the manner of funding health services, being noted in the United States, in European countries with a variety of methods of financing, in Japan, as well as in the United Kingdom.

The voluntary hospital managers

The Managers had a duty in law to provide a clean sick-house and to ensure that the doctors appointed to the staff were adequately qualified for their duties. The Managers numbered twenty-eight and were representative of the Town Council, the two Royal Colleges, the University Senatus, the Merchant Company, law, contributors and subscribers in the way of trades councils and miners' organizations. At the most, six were doctors amongst whom were never present members of the staff, although very frequently immediate past members of the honorary staff. The doctors formed the Medical Managers Committee. The Managers relied heavily for advice upon 'The Superintendent' who was medically qualified, and usually a retired senior officer from the Armed Forces or from the Indian Medical Service. They maintained a grip upon the smallest capital expenditure on medical and surgical items. The Managers might ask for the views of the physicians or surgeons, as the case might be; but this implied the views of the senior members of the staff only: the physicians or surgeons 'in Ordinary'. In the minute books most space is devoted to views upon a suitable scheme of division of the relatively small sum paid by students for clinical teaching. I remember being told by one of my seniors that one of his less fortunate colleagues might well wait to know the amount of the disbursement before deciding on his annual holiday.

Individual senior members of staff might request items, sometimes drawing attention to some grateful patient's contribution to the funds in part payment. It is apparent from the minutes that it was wise to have the Superintendent on one's side.

Another matter on which the staff were consulted was upon the resources in the way of beds to be devoted to the university professors, and it was here apparent that success was not always attained in discarding self interest while giving advice. It is evident that the Managers were acutely aware of their holding the scales of justice as well as those of commonsense in such matters. The junior consultants—'Assistants' in the term of the day—normally played no part

in giving advice although the most senior amongst them might attend the 'Staff Committee' composed only of the ordinary physicians and surgeons. The resident staff might make their views known to the Superintendent. The intermediate medical staff, on a yearly tenure of appointment, were well advised not to air views.

Most, if not all the honorary staff were engaged in private nursing home practice and were therefore keenly aware of costs and what the traffic would bear. Surgeons especially—in the light of what were small fees even for the day—were accustomed to economize in surgical supplies. They tended to carry such economies of practice into their work in hospital. Although the voluntary hospitals as typified by the Royal Infirmary were financed largely from charitable sources, there was in my day an efficient almoners' service which saw to it that patients who could afford to pay were left in no doubt about the acceptability of their contributions.

The National Health Service: boards of management

With the advent of the NHS in 1948 the Managers became the Board of Management. The Superintendent became the Medical Superintendent. The Board was appointed by the newly formed South-Eastern Regional Hospital Board, in turn appointed by the Secretary of State. The Board of Management now included doctors who might be on the staff of the Infirmary: some nominated by the University and some appointed by the Regional Board 'after consultation' with the staff and other interested medical bodies. The Staff Committee, after some hesitation on the part of the seniors, became the whole consultant staff and indeed included a few of specialist but non-consultant status. Initially the Staff Committee met infrequently and its views were communicated to the Board by the Medical Superintendent. Over the years the Staff Committee developed a structure of subcommittees representing the main disciplines and these met more frequently. Increasingly the Board would look to the Staff Committee for an opinion; increasingly the staff would press views upon the Board. Increasingly staff interests of Board members would be identifiable.

Detailed consideration of purely medical matters was carried out in the Medical Committee of the Board. This consisted of all the medical members who now usually included at least one general practitioner. The Board's Chairman and Vice-Chairman were the

only lay members of the committee. Its convener was appointed by the Board. It met monthly. The convener, flanked by the Medical Superintendent and the Secretary and Treasurer (and later, with great advantage, the Lady Superintendent of Nurses) wrestled with the problem of gaining a consensus so that an agreed minute might be presented to the Board for confirmation or reference to the Finance and Law Committee should there be financial implications of any size. The Medical Committee had the reputation of being the committee which most often had to suspend standing orders so that it could complete its business.

The views of the medical staff were sought through the Staff Committee which in turn would refer matters to the various sub-committees and eventually the Staff Committee would reply to the Board, the intention being that the reply would be that of the whole staff and not of any sectional interest.

The Regional Hospital Board

The Regional Hospital Board sought staff views from the Regional Consultants and Specialists Committee, through whom the hospital Staff Committee might make representations, and usually did so if they felt aggrieved by a decision of the Board of Management of the hospital.

In addition the Regional Board appointed 'advisers' in the main disciplines to whom they might turn for advice in matters of policy concerning a discipline. The adviser was usually the professor where the specialty enjoyed a chair.

The earlier conflict of interest tended to continue and the Regional Consultants and Specialists Committee would be consulted upon, and make representations about, matters involving terms and conditions of service as well as giving expert advice on the deployment of resources.

Reorganization of the National Health Service

With the reorganization in 1973 the hitherto separate branches of primary care, hospital care, and community health now became the responsibility of one authority, the Area Health Board, covering a smaller territory than the Regional Hospital Board. Medical staff membership of the AHBs is considerably restricted as compared

with the boards of management and the regional hospital boards. Medical advice at area level is given by an elected multidisciplinary committee, the Area Medical Committee, which is serviced by the Board. The Board are now obliged to consult the AMC on all matters concerning patient care and the AMC may take the initiative in offering advice to the Board on similar matters. The AMC has a structure of specialist subcommittees to which it may refer on specialist professional matters.

The intention is that boards will decide policy which will then be followed by the Board's administrative officers and executed at district level by the district officers who will have the opportunity of advice on medical matters, other than terms and conditions of service, from a district medical committee consisting in the main of chairmen of divisions. This last term is a relatively recent importation implying an organization of disciplines for the day-to-day management within the district. The grouping of divisions tends to be around the main specialties: medicine, surgery, obstetrics and gynaecology, anaesthesia, and psychiatry. There are at present no appointed advisers as their place is taken by the specialty advisory subcommittees of the AMC.

At national level there is a National Medical Consultative Committee consisting of representatives of the various AMCs and other interests such as Royal Colleges and universities. This Committee relates to the Planning Council which in turn advises the Secretary of State.

Allocation of resources

In different ways, therefore, in my surgical lifetime doctors have played a part in the allocation of resources. The extent to which they have done so has varied considerably with the climate and resources of the period and with the position of doctors in a contractual sense.

The days of the voluntary hospital were authoritarian both in a management sense and in the clinical fields of the wards. In the Scottish hierarchical system the 'chief' of each ward was in absolute authority and frequently made use of that authority to control minutiae of treatment. The assistants were subject to limited tenure of appointment and reappointment and so were well advised not to theorize too loudly on clinical freedom. Resources were limited. Perhaps consequent to these two situations advances were slow. Any

great claims on the Managers were likely to require a special appeal to charity. The doctors who were involved in advising about resources allocation were the senior doctors; and the decision-taking doctors were not those who were on the hospital staff.

Decisions were made easier by the relative slowness of advances in treatment and the suspicion in which all attempts at specialization were held by all members of staff for one reason or another. The more junior consultants who might enjoy better powers of speculation and have time to devote to furthering knowledge, but with limited tenure, might be well advised not to suggest that they might be expensive senior members of staff. I have already mentioned that members of staff carried the sense of economy from their private practices into hospital and that the surgeons-in-ordinary exercised varying degrees of despotism in their wards. The economy with which the 'charge' was run was shown in a quarterly circular which compared the costs one with another. Comparisons are odious, even at this remove, but it was always accepted that one unit—that of the late W. J. Stuart—was always the most economical where swabs would be washed and reused. He was motivated by a desire never to waste charitable contributions and he carried this to the extent of operating under a primitive ring of electric bulbs which gave hot, indifferent, and unfocused light on the operative field and on the surgeon's neck.

They accepted that the dispenser would issue a dole of certain items such as Elastoplast which had to serve for a week in the same way that doctors in the National Health Insurance scheme or serving the parish relief schemes accepted restriction in prescribing. Orders from wards to dispensary were signed by the resident and countersigned by the Superintendent who would certainly be on the outlook for any introduction of some expensive novelty by a junior member of staff.

Finally the Managers included in their number those who were accustomed to weigh evidence and make decisions in other walks of life. They were regarded as having charge of charitable funds and being well-motivated as paternalistic but not political animals. The Infirmary bank balance was reported at monthly meetings and was of the order of some £14,000. When the 'State took over' things became 'easier'. Increasingly demands were met and more demands were made. The staff were no longer satisfied to have their requests transmitted through the (now Medical) Superintendent.

Here was the beginning of what Godber describes as an open-ended commitment, and costs increased rapidly (1).

Until now constraints had been present in what the charitably minded were prepared to contribute and in available medical and pharmacological knowledge. With the advent of the State the financial constraint altered in that the Exchequer provided the money, and macroeconomic decisions became political ones. Research prospered and possibility after possibility of sophisticated care became known. Marketing techniques did not lag behind. The consultant staff became more and more equal and secure in tenure. Increasingly medical specialization became necessary and flourished. Each new specialty enjoyed equality of standing. Increasingly consultants became whole-time without experience of constraints outside hospital.

Hospital boards and their officers wanted to see their hospitals bigger and preeminent and able to provide for every need of patients within their territory. Most doctors, motivated by a desire to provide the best-quality care for their patients, regardless of purely economic argument, regarded any hindrance to such care as a challenge to be met regardless of financial considerations, immediate and remote. Universities wished to add to the lustre of their medical school. In a way therefore the aims of the Board, the University, and the medical staff were at one in maximizing demands. The Board might rely on the staff for advice about requirements and for argument to advance claims. Financial constraints were laid down at a higher level, and in making microeconomic decisions at hospital level it was necessary for the staff (unwillingly, in the light of their commitment to individual patients) to consider priorities in the provision of desirable advances. Other motives for medical staff demand upon resources might be individual ambition usually associated with a desire to advance knowledge, with the kudos and increasing spin-off which came with recognition as an international authority. Other constraints might include shortage of skilled staff.

I have used the term macroeconomic decisions implying decisions at national level and microeconomic implying decisions at hospital management level (2).

In addition to influencing these decisions, it is apparent that doctors in their clinical care of patients preempt resources in their assumption of clinical freedom in the treatment of patients. Surgical instrument manufacturers, drug firms, purveyors of dressings have all conspired to ensure that individual credo is catered for when

scientific evidence falters. Again clinical decision to treat a hitherto untreated type of pathology preempts resources and may even result in an output which preempts further resources in manpower and materials. Decisions to treat gross spina bifida or the sophisticated care of each and every severe head injury are examples of what I have in mind here.

Further preemption has occurred in making use of investigative facilities to which the laboratories have largely contributed by structured shopping lists which encourage impulse ordering of their wares.

It is in this area of preemption that the greatest change has occurred over the past forty years. My seniors were always prepared to cut their losses and an eye on the waiting-lists sharpened their judgement. Advances and the diminution of waiting-lists uncovered resources which were then preempted.

The situation in regard to clinical freedom is formalized in an abstract from *The Economics of Medical Care* from which I quote

> Clinical freedom is and always has been subject to the limitations imposed by lack of knowledge, lack of skill, or lack of facilities; and it still requires practitioners to exercise excruciatingly difficult judgements as to whether it is worthwhile their devoting further care and attention where the return (in a purely therapeutic sense) is likely to be insignificant or even nil (2).

From what I have written it is apparent that with the advent of the NHS the constraints and sanctions to which hospital doctors had been subject diminished considerably and the doctors' part in allocation decisions at hospital level became considerably increased. The convener of the medical committee was a member of staff and the committee was largely made up of staff.

The Board of Management had to decide on priorities in the provision of resources, and its medical committee knowing what the financial situation was, and what were the other resources in the way of space and other staffing, had to decide which of the requests of the medical staff the committee should recommend be granted by the Board.

It was not always possible to obtain a clear answer from the staff committee in reply to questions and it proved particularly difficult to obtain priority decisions from the staff. It seemed that consensus was difficult to obtain where a decision had to favour a sectional interest and woolly decisions and woollier correspondence followed.

There was an additional advantage in leaving the priority decisions to the Board in that all might then join in criticizing the eventual decision.

There would of course also be interested parties in the Medical Committee but my experience was that the bigger the occasion the less personal interests tended to corrupt decisions. Parkinson's Law operated and the committee would get most hung up on trivia. In some matters the Medical Superintendent, who was always regarded as neutral, would be given the task of assessing the worth of rival claims and his decision would be accepted.

In matters of policy staff views would be known and the convener, having at preview narrowed down the possibilities with the help of the officers, could ensure that the officers floated the possibilities and the implications for better or worse, hoping that in this way a consensus would emerge. The convener could ensure that the officers presented the unpalatable aspects of reality and avoid himself confronting enthusiasm from the chair or using his authority to demonstrate the impossibility of some course of action. Matters of terms and conditions of service might obtrude if they fell within the purview of the Board. Such matters might include compensation for injury in the course of duty; the provision of study leave, travel expenses, and research grants.

One end result of the system was that since the RHB provided the funds for the Board of Management it was only too easy for the Board and the staff to unite in lambasting the RHB for failure to make more funds available and relations were liable to strain in this way. Failures within the system tended to reflect either the situation where doctors, trained only to face clinical challenge, resented the intrusion of economics; or where there was failure on the part of administration and doctors to find common ground in formalizing the issues at stake or the indices which might be used in measurement.

Outputs to be considered were rarely formalized. Indices of efficiency tended to change and were always the subject of medical suspicion unless they supported the case of the day. What were the claims of research and teaching as compared with patient care especially where the patient care might be non-productive except in providing a desirable social and humanitarian gain in the public eye? As things stood 'cost minimizing incentives' (3) were non-existent. The decision-taking doctors had their hunches, their emotions, and their interests but evidence and 'making out cases for

a project' were often lacking. The Medical Superintendent had been brought up to take pragmatic decisions as to what was 'on'.

The administrator, busy with a considerable committee system and the day-to-day running of the hospital was unable to produce detailed analysis of costs in the past, or any indication as to what costs might be saved by a given course of action. He might with justification have thought that even if he did the doctors would not be interested in such figures except for use selectively where in part they appeared to offer support to a desired course.

Even the figures for ward costs became unavailable as much of the information was now gathered by computer which had not been programmed for such details.

I might here interpose some thoughts on doctors' place in the macroeconomic allocation of resources: an area where I am conscious of limited knowledge and experience.

In pre-NHS days decisions were taken by leagues of subscribers or the like in voluntary hospitals and by local government in the case of municipal hospitals. Doctors would play little part in them except to add their weight to appeals. In this regard the best example known to me is that of the late W. A. Cochrane aided by the late Harriet, Lady Finlay, stumping the country calling attention to the advantages which would follow the setting up of a children's orthopaedic hospital. Having in this way financed the building of the Princess Margaret Rose Hospital he could then draw the attention to the facilities whereby the local authorities might discharge their duties towards crippled children.

After 1948 these decisions became political ones. The doctors who influenced them most, I have always imagined, were the departments' medical officers who would become aware of developments and demands in a variety of ways, including study of the medical literature; lobbying discreet or indiscreet; the universities; working parties, official and unofficial; consultants and specialists committees and the lay press, often ill-informed, occasionally well informed and inspired.

The present advisory structure and the future

With the recent reorganization the hope is that macroeconomic decisions may be made after considering the views of specialist subcommittees of the National Medical Consultative Committee or of

Programme Planning Committees set up after consultation with the NMCC. In this way a final common pathway of medical advice is available with the specialists having an opportunity to present their views and the NMCC an opportunity to set a national medical priority upon the specialist claim. It is too early to form a view on this set-up and with times being hard, and no increasing resources, advice is tendered about priorities in the use of existing resources; and it seems that this advice is geared more to social and humanitarian values rather than upon medical values or cost-benefit analysis.

The area medical committee is responsible for medical advice at area level. The chairman receives all minutes of district executive groups, all agenda and minutes of the area board and its executive group. He is invited to attend all meetings of the board, its committees and executive group. He may visit all health-care establishments in the area with the board and is therefore aware of the overall situation as seen by the board and its officers. This is obviously of great advantage in his command of the over-all situation but at meetings of the AMC he is chairman, but as compared with the medical committee of previous boards he is without officer support and he may find himself arousing opposition from interested sections of the committee in presenting the complete picture of which he may be the only member aware. The chief area medical officer is of course also present and able to help in presenting the picture but I have sometimes felt that an administrative or particularly a financial officer would be an advantage in presenting the constraints under which decisions must be taken. In this way the chairman and the CAMO can the more easily maintain credibility in agreeing what is desirable were it practicable.

There are many advantages in the area medical committee not being involved in matters of terms and conditions of service particularly in that members, following a denial of some matter of service interest, do not carry over any sense of frustration into discussions of matters of patient care. There are, of course, matters involving patient care which may well have an effect on terms and conditions. Here it has been my experience to date that the AMC, as presently constituted, have by and large come to decisions in the light of advantages to patient care only. I believe that this owes something to its multidisciplinary constitution which allows it to act as an informed medical jury in coming to decisions.

One lack certainly is economic advice on the effects and relative magnitude of the results of possible decisions. There has been on occasion a desire to take the initiative in offering advice about possible economies but I, certainly, have felt difficulties in distinguishing economic mice from mountains.

As in the past agendas tend to become over-full and time is taken up with detail rather than principles. The time and effort necessarily devoted by chairman and medical secretary has been considerable.

The over-all time taken for consultation by the board remains too long, but at least results in the board obtaining advice agreed by the elected representatives of the doctors in the area, couched in clear terms.

It is perhaps justifiable to take a sideways glance at recent experiences of doctors as managers of private nursing homes. Here perhaps 'health care is different from other economic goods' (3) is not the truism it might seem. When financially involved in providing resources doctors have been known to use up hardware without a thought as to its replacement; or even to set a maximum of available resources rather than working back from an agreed quality of care. At least two nursing homes perished from neglect of simple financial principles.

On the other hand if doctors today find themselves without direct financial responsibility, they can be profligate in their advice about air-conditioning and lighting of theatres forgetting the example of W. J. Stuart's dexterity under his minor torment of unshielded bulbs, and expressing surprise when costs go up to an extent which turns patients away.

For the record the best private nursing home facilities over the past fifty years have been provided by nurses with business training and a healthy scepticism.

I have mentioned the preemption of resources in the prosecution of clinical freedom. There have in the past been attempts at restriction in the use of resources to minimize this effect. Doctors have played some part, either in advising where such restriction may be made without endangering patient care, or in acting as a peer group. In voluntary hospital days many would have their own restricted pharmacopoeia. In some there would be a limitation of supply in order to encourage economy of use. Heads of investigative departments would certainly draw to the attention of their clinical

colleagues any use of facilities which they considered unjustified. On occasion authority to order certain items might be restricted to senior doctors.

Doctors have served on economy committees under one guise or another. In the Royal Infirmary representatives of different disciplines and a member of the Board used to meet under the chairmanship of the Professor of Therapeutics. The chief pharmacist was in attendance to bring to notice current fashions and perhaps follies in prescribing, and in the use of materials, instruments, and appliances.

On occasion there would be agreement that certain drugs or materials could not be justified on scientific grounds. After each meeting it was the custom to circularize clinicians drawing attention to the situation. It was significant that for a period of about three weeks there was a drop in the use of whatever material had been brought to notice. Financial control was never sufficient to demonstrate what savings were possible in this way or what were obtained by it. It was therefore never possible to size the carrot which might be offered to each discipline. As I have indicated, feedback arrangements possible in an unsophisticated age failed to be possible in a more sophisticated age.

So far as the future is concerned, my belief is that the divisional structure offers better prospects of controlling preemption of resources. I believe that it is not likely to be efficient in this where the division is other than institutionally oriented. It should not be difficult as a divisional exercise to show differences in the use of resources and to encourage the better use. A *sine qua non* would be that savings accrued to the division to be applied to realizing its top priority.

With increasing mechanical presentation of performance and the possibility of disinterested presentation of fact I believe that there would be possible a scientific appraisal of personal choices which at the moment are matters of credo.

So far as advice in decision-making at hospital level is concerned I believe that doctors are capable of giving sound advice provided that:

1. Decisions about terms and conditions of service are excluded.
2. Adequate financial and administrative advice is available.
3. Community medicine specialists provide data and options.

4. There is clear pronouncement about the finality of financial discipline once medical and other advice had been considered and decisions made.

5. That no success attends individual doctors practising special pleading, political lobbying, or inspiring newspaper campaigns.

6. That the doctors involved in advice-giving represent a cross section of the health service.

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Some views of the current dilemma of American medicine

ERNEST W. SAWARD

Some views of the current dilemma of American medicine

A general retrospective to date

An occasion that commemorates the 250th anniversary of a world-famous institution inherently makes one reflect. We in the United States have also had particular cause to reflect a great deal in 1976 which is the bicentennial of the nation, and the structure wrought then has only recently again been tested by divesting an errant president; fortunately it has proven strong. This year is also the fiftieth anniversary of my own university medical school and that is of course so brief a time as to allow me to know most of it personally. It is extremely difficult to have a proper historic perspective, but the past fifty years, the period between 1926 and 1976, seems to have produced as much change in medicine and how medicine is regarded by the public as the period between 1726 and 1926.

The problem under discussion is the present state of medicine; how it is regarded within the profession, and how it is regarded by the public and how at least in America, the public has begun to regard the medical profession itself. One must hasten to say that America is very diverse, and this general characteristic is well reflected in its arrangements for health services. America's diversity is demonstrated in its health statistics. One can hardly speak in exact terms and hence it is perhaps more useful to speak of trends that are occurring rather than inferring a homogeneity that does not exist. To describe trends one must first look backward.

In the distant past, 250 years ago, medicine was, as it had been for centuries, an honoured and respected profession. The profession of course had a defined body of knowledge in which it firmly believed just as it does today (1). With the exception of the knowledge of anatomy, most of what was then known and believed would today be

regarded as erroneous. If one applied today's standards of outcome measurement to the interventions made by the medical profession in that period one could only conclude that these were largely harmful. Purging, puking, and bleeding is hardly the way to treat pulmonary or intestinal infection. If the interventions were truly as disastrous as they seem to be in retrospect why then was the profession so honoured and respected? The answer reveals in part a paradox in our own time. The profession was honoured and valued for its caring function, for its ability to show concern, and belief that it could explain disease whether the explanation would now be considered scientific or not. The belief almost universally held in that period was that one's health was in divine hands and not to be totally determined by a mortal physician. The overwhelming majority of the sick endured their illnesses without benefit of the profession at all. Hospital admission was a last resort of the despairing and usually destitute. Surely for most there was deep fear of going to hospital.

By 1926 there had been great change. While the conquest of infectious disease was yet to occur, the sanitary revolution had vastly lowered its incidence. With asepsis and anaesthesia, surgery had made significant technical advances, particularly concerned with diseases sited in the abdominal cavity, and great strides were being made in surgery inside the skull. The open thorax, however, was yet to be fully exploited. Liver therapy for pernicious anaemia had recently been added to the armamentarium as was insulin for diabetes. There is no question that by outcome measurement it was more beneficial to have medical care than not. The public belief in the physicians' power had been greatly strengthened and, I presume for quite other reasons, in divine power apparently lessened. The attitude towards use of hospital, except among the older generation, had also considerably changed. The physician was honoured and respected. He generally knew much of the population of the area in which he lived and practised and knew many of them over long periods of time. Both the caring function and the curing function were evident and well regarded.

The majority of the population, regardless of ability to pay, received medical care for major illness. Major illness was also, however, beginning to be costly with burdensome results for the working population. And while in Europe social insurance to cover illness was becoming common, it was essentially nonexistent in the United

States despite considerable discussion. The attitude towards medicine and medical care was, however, optimistic. Progress was being made, and as the study by the Committee on Costs of Medical Care in 1931 indicated, the path ahead was clear, if the profession and the public would engage in the delineated reforms (2). The careers of most of my generation in social medicine have been spent encouraging this reform. There has been progress despite great variation; for the past decade most of the population has had some form of health insurance to meet significant portions of the large expenditures for medical care. Although the funds spent in the United States are enormous, the results are quite imperfect.

In the past fifty years by far the greatest achievement largely occurring in the two decades between 1935 and 1955, has been the conquest of infectious disease. There have been vast advances in basic scientific knowledge and significant advances in medical technology. Since the conquest of infectious diseases, however, measurable advances in health indices have been very slow despite large investments in research, particularly in the fields of heart disease, cancer, and stroke, and their associated conditions. The causes of these diseases lie in genetics, environment, and life style; their avoidance seems little related to medical care. The technology for their management, but not cure, has significantly advanced but at enormous costs. Renal dialysis and organ transplant epitomize the contemporary technology and the expense engendered.

Thus, until a decade or so ago, the profession had a great aura of success. While it largely stemmed from the conquest of infectious disease, technology seems to hold greater promise for the now more common chronic diseases than has actually occurred. The expectations of the public were high. The press had published stories of miracle drugs and technological miracles and the belief was that all would be well if there were just more; more manpower, more money, and more miracles. During that period, a decade ago, the Congress of the United States did its best to provide these. But a decade of turmoil has ensued and the health expenditures have increased far faster than the measured product of the economy with little change in health status.

The cost problem. The public, the profession, the institutional providers of health services, and the politicians are all ill at ease reflecting on the events of the past decade, and their present situa-

tion; and from their different points of view see different problems and different solutions. The problems have been stated and restated so often that only a brief sketch need be made here. The most apparent of these problems is the cost of health services. These are now costing one-twelfth of the gross national product and their rate of increase is 50 to 60 per cent faster than that of this index. More than 40 per cent of this expenditure is now from tax funds and these are conspicuous in their competition with other national and local priorities. Another slightly more than 30 per cent of these funds are from Blue Cross or other private insurance mechanisms. For these, the public rate review processes now draw public attention and debate in much the same way as do tax funds.

While it is clear health spending will rise, it obviously cannot continue to rise faster than the productivity of the society in which it occurs. It is also becoming progressively conspicuous that the increasing expenditures in health services and medical care are not resulting in a significant improvement of the health of the population. Some people are living a few years longer at very high costs without either they or their family feeling that this extension of life without enjoyment is worthwhile. The chronically disabled survive longer. Many infants with various congenital diseases are kept alive for long periods with no hope of enjoyment of life for either the child or the family. In the United States the number qualifying for disability payments is increasing at a faster rate than the increase in the work force. Large increments in hospital costs due to technological innovation in the last decade only occasionally result in cure; more frequently such tertiary care, if it preserves life, also prolongs disability.

Another major cost factor has been the expansion in health services to include problems that fundamentally derive from societal stress. The growth of this category is less frequently discussed than the technological changes. Two examples may clarify this point. Thirty years ago there were only one-tenth as many nursing home beds in our country as now. The dissolution of the extended family and the creation of financing for this service by modifications of the Social Security Act produced an explosion first in building such facilities and then in explosion of operating costs. A second example concerns the definition of illness. Today alcoholism, drug abuse, and many other such deviations in behaviour are considered illness. These problems were once regarded as sinful or criminal and did not

fall under the medical rubric. It may or may not be compassionate to regard them as medical problems, but they are treated medically and if the outcomes are difficult to measure the expense is enormous. The more we expand the definition of illness and expectation of the power of the health professions the greater the total cost will be.

The access problem. In addition to high cost there is a prevailing conception of lack of access to primary health care services. Over-specialization has produced public alienation. It has also produced a public belief that there is a shortage of physicians, when in fact it is the very abundance of physicians and their technical work that produces an unsustainable cost. States which have one physician for every 500 people have no better health indices than states which have one to 1,000 but they invariably have higher per capita health care cost. Where physicians are in the greatest number, such as New York County (where there is a physician for every 110 people) dissatisfaction with accessibility and the high cost of health services is often greatest. It is true there is a maldistribution of physicians both geographically and by specialty but scarcely an over-all shortage. Perhaps as great a difficulty is the lack of organization of the health services responsible to the populations being served. The inefficiency occurring through this lack of organization is defended by the profession under the guise of personal freedom and free enterprise. The 'unseen hand' thus becomes the allocator.

The equity problem. There is also great concern with quality of health services. Again it is highly variable ranging from some of the finest in the world down to quackery and outright fraud. Hence there is a great controversy about malpractice, about relicensure, about Professional Standards Review Organizations, and utilization review. Continuing education is a lively topic in the profession as it is now mandated by some of the states.

In addition to these classic topics of cost, access, and quality there are significant issues of equity in the present American medical care scene. For example, the Social Security Administration reported that in 1974, of those people under 65 years of age, 42 million had no hospital insurance, 43 million had no in-hospital medical or surgical expense insurance, 123 million had no insurance for visits to doctors' offices, 168 million had no dental insurance, and 127 million had no insurance for nursing home care (3). Such large gaps in health care

coverage in our present consumer society add significant pressures for change.

The Constitution of the United States does not mention health services. All those matters not covered in the Constitution for federal administration were specifically left to the States to decide. Indeed, until Medicare and Medicaid were enacted and implemented ten years ago the Federal Government had little expenditure for direct health services except for the armed forces, veterans, native American Indians, merchant seamen, and other similar narrow categories. Now however, the Congress of the United States has hundreds of bills introduced every year pertaining to health services, education of health professionals, and research. Each year the state governments also have hundreds of bills introduced. It is a rising tide of political activity stemming from the pressures of high costs, unorganized access, and lack of equity. We have had much rhetoric about health care as a basic human right. Several important national legislative acts have incorporated such language in their preambles.

One of the major misunderstandings that gives rise to frustration, rhetoric, and confusion in the profession, the public, and the Congress is the 'rights' issue. We have a society that tolerates variety in the economic status of individuals. All we ask is a subsistence floor of support. We may argue about the level of the floor, but there is ready acceptance of great distance between the floor and the top. When it comes to health status it has been shown that this varies widely for many disease conditions by economic status. This, it seems, is politically unacceptable. Yet the discrepancies are present in every society under every political system and every health service system. The 'right' can hardly be to equal health status any more than the right to public educational opportunity confers equal wisdom. One can legislate equal rights to access to health services, but hardly equal health status. Certain members of the Congress apparently do not wish to accept this concept.

The continued growth of medical technology has given us the power to do more than we are now willing to fund. One solution to our problem lies in further basic scientific research into life processes. Even in this period of widespread cynicism there is still the widely and firmly held belief that the advancement of knowledge is the best way of advancing human welfare. At the same time we are concerned with the possibility that the technology resulting from such research will continue to escalate the cost of medical services

faster than our general productivity. The great cost-saving victories in infectious disease lie behind us, and the problem of disproportionate cost increase is upon us. The solutions are complex and the priorities will be largely set by the political process; it remains doubtful that the medical profession as a group will provide significant leadership. Throughout the last decade American society has been willing to move faster than organized medicine which has constantly put up a vigorous rearguard delaying action. It is true that most individuals who have physicians admire and respect them. But it is also true that governments have less and less respect for and confidence in the medical profession and regard it with increasing cynicism. Legislators assume the position organized medicine takes is in its own interest and not in the public interest. Paradoxically medicine is able to do more and more but respected less and less. The rise of malpractice actions is symptomatic of this change. Two hundred and fifty years ago when medical intervention not infrequently had a negative effect it was honoured and respected for its caring function. Medicine is now honoured and respected for its curing function. Its caring function appears to the public to have atrophied, and to a growing extent delegated to ancillary personnel. If this description of medicine's dilemma is at all accurate it should not be a cause of despair but a challenge to give our efforts a more publicly responsible direction.

Challenges and remedies. There have been many approaches to the health service problems in the United States. It has been characteristic that there has been no over-all health policy or grand plan. The approach has been piecemeal and it has been somewhat like constructing a mosaic without a prior drawing. The political process has been very susceptible to special as well as general interests particularly those of organized medicine, the private health insurance industry and the organized hospitals. It is also important with regard to special interest to point out that the aged are well organized and do vote, whereas children who are far more numerous are unorganized and do not vote.

By 1960 it was clear that the private health insurance systems in a free enterprise setting left out of coverage significant populations at high risk and hence high costs. These of course were the groups that were also economically at a disadvantage and had no means of payment. The major event so far in the approaches to the problem

discussed was the passage of the Medicare and Medicaid legislation in 1965 and the various subsequent amendments and modifications of it. The clear intent of Medicare and Medicaid was not to change the system or method of payment but simply to provide payment and thus more equity for the aged and disadvantaged groups. The disabled were also subsequently entitled under this Act as were those with end-stage renal disease. The legislation in its preamble forebade altering the health service system. The Act has been subsequently modified in a variety of ways, so that now a decade later, the Social Security Act appears to be one of the main vehicles not only for payment but for change (4).

The escalation of cost in the health care system and the significant increase in the portion of these costs that is tax funded are attributed by many to Medicare and Medicaid. In all fairness, however, it must also be added that the decade of these categorical entitlements has also been the period in which most of our contemporary tertiary care technology has been introduced. Additionally there has been considerable concern with payment mechanisms themselves. The first was the change from hospital charges to retrospective hospital costs. From 1971 to 1974 wage price control was established, first comprehensively but ultimately applying only to the health and petroleum industries. We have also had various attempts by states to freeze Medicaid payments. Some of the states have attempted to make their reimbursement method that of prospective costs. Capitation payments have been discussed but in the health care system there is no defined population base or single organized provider to use. The fee for service system, strongly written into Medicare and Medicaid, and thus reinforcing particular service delivery models, assures that more is better and hence 'quality' inherently means more costly.

Though national health insurance has been much talked about and many proposals made in legislative bills, no such general entitlement has come about. Of the legislation introduced to date only one major proposal contemplates changing the health care system and the payments mechanisms in a fundamental way. Proposals which seem most legislatively viable reinforce the present system and rely on indirect controls to manage cost. But all these indirect controls to date have failed.

Federal manpower policies. A different approach has been to attempt to change medical practice. Twelve years ago, when the government first came to the aid of medical and allied health schools financially, it was simply to provide for more manpower. There were economists advising government on the basis of market theory, that more manpower would lower costs. In the United States at least it is quite clear that more manpower elevates cost, and there is a direct correlation amongst the states indicating that those with the highest ratio of physicians to population also have the highest *per capita* cost for health services. Demand for technical medical service is more provider-generated than consumer-generated. Having finally realized this, government is now attempting to change both the geographic distribution of physicians (a problem not well solved in any country) and trying to develop for reasons of access and efficiency more primary care physicians and fewer specialists. There has been too great a proliferation of specialists and too few generalists. In addition to government proposals mandating primary care training programmes in medical schools and in hospitals at certain ratios there is also the sponsoring of nurse practitioners, physician assistants, and hopefully, of the health team. There has even been considerable discussion that the rigidities of the licensing systems create large inefficiencies in the organization of health services, and rather than state licensing, accreditation should be done by institutions on the basis of the work performed and the proficiency demonstrated, allowing mobility between categories. This has not been adopted and seems unlikely to be. But there is an emerging trend to deprofessionalize personal health services.

Controls. Following the post-war assumption of a scarcity of hospitals beds in the United States, the federally funded Hill-Burton Act resulted in a great proliferation. This excess must now be curtailed. Apparently more beds in relationship to population result in more hospitalization of that population and control of the number of beds means control of inappropriate hospitalization. As a corollary of this there must be alternative means of care, both of ambulatory care and of chronic care in more appropriate beds. 'Certificate of need' legislation now demands government permission to change or add to facilities. Some states have already had such provisions for a dozen years, applied to organized ambulatory services as well as to hospital services. Only in the past few years have local and State

governments realized that the control of operating funds is as important as the control of capital funds. Very few political jurisdictions have yet authorized planning agencies or review councils to control operating funds. Nowhere in the United States, however, have regulatory and 'certificate of need' mechanisms been extended to the private practice of medicine. Physicians are still entitled to build what they want, where they want, and with whatever services they want. Hence we see communities where computer-assisted tomography is used in physicians' offices when hospitals are unable to obtain certificates of need for such equipment. Again, there is no over-all plan and no comprehensive approach.

Appropriate use of hospitalization with regard to level of care and length of stay has been reviewed through the Medicare rules and regulations and by programmes initiated by the Joint Commission on the Accreditation of Hospitals. This approach has during the last three years been enormously elaborated in federal requirements for Professional Standards Review Organizations (PSRO) creating technical process review of all institutional care for publicly financed programmes. PSROs are bodies of physicians usually organized by the local medical society in federally designated areas given a legal mandate of peer review. This unquestionably will have effects upon the way medicine is practised. It will make for a more uniform technical process, and may elevate the requirements of this technical process. It is too soon to evaluate the full impact of this legislation but it has been suggested that it could add to the cost of in-hospital care offsetting the savings achieved by its operation. One thing, however, is certain: it is an approach to health services utilization by federal mandate present in no other nation. An evaluation of its effectiveness will inevitably be complex.

System reform

Another approach taken by government in the last three years was the federal Health Maintenance Organization Act. In this model defined populations are enrolled with extensive comprehensive benefits (specified by law) into organized systems of health care on a prepayment basis. The prototypes of this such as the Kaiser Foundation Health Plan and the San Joaquin Foundation for Medical Care have shown significant savings particularly in reduced hospital use. The appeal to government is immediately obvious. If

these savings in hospital use and consequent cost savings could be applied nationally, multibillion dollar savings of tax funds would result. There are also other appeals to government in this concept. It shifts the responsibility for control from the government to the contractual provider and leaves the government free to negotiate the contract and evaluate the result. It allows competition to control rather than narrow regulation and competition is felt by many economists to be a method of regulation superior to public utility controls. It is also philosophically compatible to many conservative elements in government in that the competitive way is of course the free enterprise way.

Prepaid group practice, evolving over the past forty years in the United States represents the most highly integrated form of the Health Maintenance Organization (5). Its significance is threefold. First, it perceives the problems of cost, access, quality, and equity and organizes a system to manage them. The success of the system can be readily measured by the growth of voluntary enrolment. One such programme has grown to over three million members, the largest single non-governmental direct health service in the world. Second, it answers the dilemma of responsibility, not only for patients, which is readily accepted by physicians, but also for defined populations and not through stultifying detailed public-utility type regulation, but through loosely regulated competition in an as yet largely unabashedly competitive society. Lastly, it is an American form of health service organization not significant elsewhere, and uniquely adaptive to its present cultural circumstances. The prognosis for this form being a significant part of the future health care system depends largely on the rigidity of the legislative prescription for national health insurance. If the mandate is not sensitive to the values of system choice it could well be a Procrustean bed. The shift of mode of practice from solo to organized group form will not occur by edict, but by economic pressure from consumers if legislation will permit such free choice of systems.

Regionalization. Enacted just over a year ago and not yet fully implemented is the Comprehensive Health Planning and Development Act signed into law in January 1975. This Act like other federal legislation is the result of compromise and is complex and controversial. The intent, however, is relatively clear. It is to create local health systems agencies of specified size throughout the United

States. Over 200 such agencies have now been designated and are in the process of formation. These agencies are to design a comprehensive health plan for their local areas. They are to be governed by a consumer majority and they are to implement (with possible fiscal penalties upon providers for non-compliance) the Health Systems Agency plan. A provision to control health insurance rates was removed from the Act just prior to passage as part of a political compromise. Universal entitlement under national health insurance was considered imminent, and the Health Systems Agency was to adapt national health insurance to the local areas under federal guidelines. It is an interesting and useful design for regionalization. At the moment the same Congress that passed the authorization for this development is reluctant to appropriate adequate funds for its implementation.

Preventive medicine

Until a few years ago there was little general concern with the development of a national health policy. It remained largely an academic exercise. Now legislative bodies and their staffs, national health associations of various kinds, consumer groups, groups of industrial leaders, and a much wider group of academicians of differing disciplines are interacting in this process of development. Measuring devices with regard to efficiency and effectiveness in health care are not readily to hand, however, and there has been great interest in the development of population health indices and outcome measurements of the effects of medical care. Apparently very costly medical care services are not as intimately related to the general health of the population as control of family size, status of environment, employment, life-style, socio-economic and cultural factors. Voluntary and governmental undertakings in health education impress the population that individual concern for health and appropriate life-style is more rewarding than relying on the medical care process. This is a difficult counter-current to the values and life-style portrayed by American mass media.

Summary

In dealing with the last two centuries and particularly the last fifty years, I have tried to show how the accomplishments of medicine

have changed attitudes, to portray something of the dilemma in which health services are at present, and to indicate the opportunities and challenges for fundamental improvement that this affords.

The knowledge and skills in health care today outpace the resources available to sustain the costs of their application. Public expectations from medical technology are great and the resounding sentiment is that all should share equally in this bounty, regardless of their ability to contribute. This has been considered a 'right'. But inasmuch as the resource is circumscribed by our other societal goals and our health care costs escalate faster than our societal productivity there is a dilemma.

The answer to this dilemma has been sought in several directions. One answer is through effectiveness and efficiency. This ranges from regulation and control of process to attempts to validate medical care by outside studies. It also emphasizes the need for reform in the structure of the contemporary health profession with primary care practitioners and nurse practitioners and restructuring of these services by organization of HMOs and ambulatory health centres. Most importantly the need for organization of finance to overcome discrepancies produced by limited categorization of entitlement.

Solutions to the dilemma depend on clarification of goals and priorities. What is to be expected of medical care, health care, health education, environmental measures, and a change of lifestyle? What is the consumer bias, and the political bias? How does one distribute resources for both equity and effectiveness? The decisions will be determined in the political process and the political process in America has meant a constantly changing compromise, never the adoption of a Utopian plan. The medical profession cannot be passive in this. It can alienate the public in confrontation and rearguard action or it can understand the trends in society and lead in new relationships. Either alternative implies profound change in how the medical profession will be regarded.

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11

Governments and medical care

ROSEMARY STEVENS

Governments and medical care

I was pleased to be asked to talk about governments and medical care, for these words have a sober, serious ring, appropriately commemorative on an occasion such as this. No one can deny the necessity of some 'government' nor be against 'medical care' as such. Nor, indeed, can one quibble that the two have some connection. The provision of medical care has become inextricably intertwined with government, whether one has a health service under public management, as in the United Kingdom, or one subject to public subsidy and regulation, as in the United States.

Yet, there are serious concerns on both sides of the Atlantic about the proper role of government in an era distinguished by appreciation that resources for medical care are finite: that the costs and benefits of medical care should be spread reasonably over the whole population, and that this can only be done through taxation or government regulation; that increases in expenditures on medical care do not necessarily mean concomitant increases in value received, in terms of alternative social benefits; and that in some respects, we may run the risk of becoming an 'over medicalized' society, to our own detriment. In short, decisions on many aspects of medical resources are political and economic: the result of social decisions rather than of individual judgement, or even the judgement of physicians to which individual decisions have traditionally been delegated.

The question is whether, given the common pressures of modern medicine—which impose on governments both financial and ethical choices of how resources ought to be distributed—different countries are moving to common solutions. Is the government role in medical care one that we can generalize about, at least in the next

decades? Are we all moving in similar directions, so that two hundred and fifty years from now our health services may look quite similar?

I should like to argue that the government role in Britain and the United States is in some ways moving in similar directions: but only up to a point. Both 'government' and 'medical care' have variable meanings. We use the same vocabulary but we often mean quite different things. The customs and traditions of government in dealing between government agencies, as well as with private groups, provide a predetermined context for the developing role of government in medical care. But medical care, too, may have quite different meanings in different places. Thus, while there may be great value in future comparisons of medical services, differences will undoubtedly remain in the scope and nature of government intervention in medical care on each side of the Atlantic; not because the technological processes are necessarily different, but because distinctive patterns of behaviour have been slowly built up in the last two hundred years.

The government role in Britain

On the face of it, the United Kingdom and the United States have built, over the years, a quite different set of relationships between government and medical care. Ideologically this is expressed in the lingering rhetoric of a 'Welfare State' in Britain and in 'private enterprise' in medicine in America. Yet the role of government has been changing in each country, particularly over the last thirty years. The old labels no longer suffice; indeed, each country is looking warily at the earlier concepts of the other. The National Health Service is moving away from its earlier centralization of management to decentralized health services, and to a greater use of what in the United States are called consumer organizations. Meanwhile, in the United States, a system originally distinguished by decentralized private controls is moving to one with a much firmer government relationship. Some scholars are now using the phrase 'The Contract State' to describe changing relationships between government and private groups in both Britain and the United States, to take into account the noticeable increase in the use by both governments of private and quasi-public agencies (1, 2).

To understand how far the two are becoming similar, it is worth

looking at their concurrent developments in the past decades. Interestingly, health services in both countries have gone through three distinct phases of development since the ideological debates of the 1940s.

In Britain, the NHS began with a period of nationalization, moved to a period of administrative consolidation during the 1950s and into the 1960s, and with reorganization in 1974 began a third period of change.

The first stage was one of political idealism and practical success: comprehensive health care was to be assured and provided by a democratic government and largely paid for out of general taxation. Looking back to the 1940s, the achievement was astonishing. Hospitals were nationalized and grouped into regional and local consortia; consultants and specialists put on salary and given specific assignments in geographical regions; virtually the whole population signed up with general practitioners; and local governments provided ambulances and other supportive services. The structure was in many ways unwieldy, but it worked. The middle-class population came rapidly to accept medical care as a right; as natural a privilege as free education. The medical associations lost the embattled shrillness of the earlier parliamentary debates; the NHS became an essential plank in the Welfare State. By the early 1950s, there were few calls from anyone for a return to a private enterprise system (3).

The second stage of development was under way by the time I entered the NHS as a hospital administrative trainee in 1957. The services were being consolidated with remarkable success. I remember sitting in the offices of the Sheffield Regional Hospital Board reading, as one of my first assignments, the reports of the hospital surveys which preceded the NHS little more than a decade earlier. It was extraordinary how quickly the old 'non-system' of independent hospitals and itinerant specialists had been harnessed into an organized hospital service. The system looked as though it had been there for generations.

This second period of consolidation was beginning, however, to be seriously challenged by 1960 as success began to give way to smugness and to criticism. Smugness was apparent not only in self-congratulations within the NHS—comparisons with the United States were only too evident—but also apparent in the less than dynamic management by professionals, and by voluntary groups on

the hospital management committees. While some were undoubtedly very effective, others appeared to be little more than rubber stamps, or administrative conveniences for participating physicians. But there were, of course, many other problems in the NHS as it was developing. The awkwardness of the tripartite structure of the health service inevitably led, through years of debate, to pressures for major reorganization of all health services into integrated local units. Reform of local government, organizational changes in community nursing services, and reform in the social services, provided a final impetus. Thus the third major stage of the NHS began in 1974 with a reorganization of health services which was, in its way, as historic and imaginative a development as the original National Health Service Act of 1946.

This is an old story but one worth reviewing in historical perspective in the light of government responsibility in medical care. Despite the gloom cast upon reorganization by lack of funds and inevitable problems of morale among professional staff whose careers were suddenly shifted, reorganization has had effects which are important in an international perspective.

First, the deliberate attempt to create a unified, comprehensive, area-wide health service in which hospital, family practice, and community health services are combined, has subtly redefined the concept of a 'health service'. In theory, at least, the health boards and their designates are freed from blinkered constraints, and able to look at health services as a whole, on a population basis. Decision-making in any field can never be divorced from current constraints—the personalities, power structures, budget allocations, and politics inherited by the new agencies obviously make changes incremental rather than revolutionary. Nevertheless, the underlying message and challenge of reorganization was to rethink what health services are, and which services are appropriate, within a given budget, for a given population.

This notion may seem obvious to the British but it is a veritable pipe-dream in America. In the United States the talk about area-wide planning, community health services, health maintenance, and the like is rhetoric rather than reality. A notable example is provided by the reports of the privately funded National Commission on Community Health Services, which worked during the early 1960s to develop a plan for local health services in the United States. The final report (4) offered a series of recommendations for the develop-

ment of comprehensive health services at the local level, but there was no commitment to such a change in real-world politics. Americans are struck by the language of the British Green and White Papers on reorganization which begin by assuming that health services ought to have a demographic and an epidemiological base, ie, that in a given population there may be so many old people, so many children needing specialized services, and so on, and that one plans services on this basis (5, 6, 7, 8). In the United States, debates tend to assume that a health service is a collection of buildings, equipment, and physicians; that medical care is an 'industry', and that this industry is dominated by entrenched organizations, competing power centres, inventive entrepreneurs, and Machiavellian interest groups (9, 10). In its simplest form, one concept is population-oriented, the other is 'producer-directed'.

A second important element of reorganization of the NHS evident to the outsider—and one made more striking by Britain's general economic situation—has been the reaffirmation of government's responsibilities to assure and to provide health services to the whole population: services which are both universal and (within budgetary limits) comprehensive. The uncompromising language of the National Health Service Act created public expectations of what government ought to provide. Health services were part of a package of supporting services: a floor from which individual initiative would flourish. In a welfare state, private enterprise might lose its most ruthless edge in providing opportunities for rich and poor alike; both would benefit from tax-supported education and health services, as well as from income security and housing benefits. But the underlying purpose of the welfare state in Britain was not so much to provide equal economic opportunity as a ground rule of democratic capitalism, so that anyone could go out in the manner of Horatio Alger or Samuel Smiles to make a fortune in the world. Rather, the welfare state symbolized a struggle to provide for everyone a certain quality of life (11).

This goal was undoubtedly in part a reflection, in the post-war years, of a desire to sweep away the old pre-war class inequities and to restructure the various elements of society. But the result was that the ideology of the early welfare state was not primarily economic, but was rather visionary, humanistic, and egalitarian. In the United States, in contrast, the ideology of government provision of health services has continued to be economic and/or strategic. Change,

where it does take place, is through compromise, 'trade-offs', and pressures.

Health services are still regarded as a necessary part in terms of the British fabric of life, and the government role is to provide them. While the economic rhetoric in London is now towards a deliberate attempt towards private enterprise generally, and a down-playing of the welfare sector, the most important effects on the NHS promise to be restricted budgets rather than any massive changes. The most important changes have perhaps already taken place. Reorganization has emphasized, in its structure, area-wide responsibility for planning and managing health services. It is true that continued belt-tightening may push the various health authorities to define new priorities more starkly than before, and to assume much more real authority than the early governing boards were able to exercise, but these changes may be all to the good. The point is that initial goals and aspirations remain.

In terms defining medical care substantively (as deriving from specific population characteristics) and ideologically (as government guaranteed), the NHS points to directions which may be relevant in the future in the United States. British health services have also developed another characteristic which has more than a parochial interest: the decentralization of responsibility for health services from London or Edinburgh to area and district agencies. In Scotland, political devolution may further emphasize this process. Structurally, in thirty years the NHS has moved from a largely centralized service based on pre-existing power formations and institutions, to one which is community based, integrated at the area-wide level, and in which there is substantial local and private initiative.

Oddly enough, the government role in medical care in Britain, beginning as a dominating force, has lessened. Indeed, the signs promise increasing authority to the private groups of individuals who make up the health authorities and councils and to the professional administrators, including physicians, who run the service on a day-to-day basis. What foreign observers have seen in Britain in the last thirty years is a shifting of responsibility from central government to local agencies, a shift from parliamentary decisions to decisions made on the local level. The various processes of consultation between health boards, local groups, health councils, professional advisory committees, local governments, and social service agencies,

make decision-making much more open or 'pluralistic' than was true of the NHS in its first twenty-five or thirty years when it was, in fact, largely run as a professional service by professionals.

It is interesting that this consultation process makes the health boards much more like their much weaker American cousins, the newly developing health systems agencies, responsible for planning health facilities, if not services, in geographical regions. There is thus an immediate American interest in the functions of the reorganized British system. Indeed, in the future there may be much value in comparing notes between the decisions, the functions, and the processes of these two sets of agencies, both set up and subsidized by their respective governments. Both will be forced to grapple with the distribution of scarce resources, the guarantee of minimum benefits versus the demands of powerful hospitals for new departments or equipment, the balancing of priorities among competing and righteous interest groups.

Substantively, ideologically, and structurally, then, these developments in Scotland, as in the rest of Great Britain, make the government role in medical care much more relevant for comparison with that of the United States than at any time in the past history of the two nations. The present central government role in the United Kingdom can perhaps be broadly classified into four heads: First the government is financial manager, raising taxes and disbursing them; second, it is responsible for the regional distribution of resources; third, for general standards of administration (construction and so on); and fourth, for over-all regulation. These elements of the governmental role are, interestingly, not too dissimilar from the situation which has been developing over the same period in the United States.

The government role in the United States

Meanwhile, a rather opposite process has been taking place in the United States. While the NHS has been decentralizing its organization, US health services have been increasingly subject to central (federal) standard setting.

In Britain, at least since 1948, government has had a decisive and unquestioned role in the provision of all aspects of medical care. In the United States, until recently, enormous efforts have been made either to ignore the government role altogether, or where it

clearly does exist, to justify government intervention in terms which are only peripherally concerned with medical care. Government provision of health services has as a result, had an uneasy history in America. The two large government programmes that do exist, Medicare and Medicaid, both established by legislation in 1965, have economic rather than humanitarian aims. Medicare is designed to protect the income of the elderly from devastating hospital bills; Medicaid to stop the continuing cycle of poverty and ill health for those who are already indigent.

Medicare provides insurance benefits and hospital care, doctors' bills, and certain other health services for twenty million Americans, chiefly for social security pensioners. The federal government collects the taxes and manages the insurance funds. It pays bills by arrangements with recognized private insurance agencies. Yet Medicare is regarded not so much as a health service, but as a form of income security for the elderly. As with most other government-supported health programmes in the United States, the health aspects are subsidiary to other social purposes. Medicaid, a similar vast programme of federal grants to the states to provide medical services to the poor, also has as its first aim the protection of income, rather than the provision of organized medical services. Both Medicare and Medicaid subsidize medical bills; neither guarantees any form of service.

In other respects too, the government role in the United States is subordinate to other goals. Health services are provided to the military and to veterans in vast government service systems. The Federal Health Employees Benefits System provides fringe benefits to public servants. Numerous other programmes have developed in the last ten years which deal with the construction of facilities, or the provision of services for special population groups. Again, these have typically been generated by goals which were not primarily to provide health services. For example, health services are provided to migrant workers as part of an over-all package of benefits to improve the economic conditions of this group. There is no over-all health service ethic as such.

Yet, at the same time, the government role has become extensive. Public funds now pay about 40 per cent of all monies spent for personal health care in America. Congress is concerned about how the public money is being spent. Thus in the three periods of development in the government role in medicine in the United States since

the end of the Second World War, one can see a very different series of processes from those developing at the same time in Britain.

First, there was a period in the late 1940s in America when there was a flirtation with the idea of national health insurance. But it was an idea which would ultimately be rejected. There is still no national health insurance for the whole US population. Instead, in the period 1946 to about 1963, most new government programmes were involved in different forms of subsidy and investment in the health care sector. This was the time of the build-up of the National Institutes of Health and of the subsidized development of private hospitals in rural areas, and later in urban areas, under the Hill-Burton programme (12).

Between 1963 and 1966—the era of the Great Society—there was a second stage of development. Based on public goals to eliminate poverty and improve general social conditions, numerous social programmes were developed in a very short period, including Medicare and Medicaid. Again, though, it is important to stress that these public programmes had many characteristics of the private sector and were not 'health services' in British terms. Medicare, for example, is rather like commercial fire or car insurance, its purpose being to protect individual income against financial catastrophe. Medicare's structure and form mimic those for commercial medical insurance policies.

Thus, Medicare primarily covers the enormous costs of hospital care in the United States. It does not cover services which in Scotland might be regarded as important for the quality of life. Even with respect to the elderly for whom Medicare is designed, services such as dental care, services to improve hearing, eye care, meals-on-wheels, and many other home care services are excluded. Nursing home care is only available for those who have been discharged from hospital. Benefits outside hospitals require the beneficiary to meet the first set of charges on each year's bill and there are specific limitations on services. Medicare is a complicated programme based on risks. As the cost of the programme goes up, benefits may be cut or charges and contributions may be raised.

Whereas the role of government in medical care in the United States in the 1940s and 1950s had been to stimulate investments in health service resources (new buildings, more research, additional professionals), in this second period the government role was that of an entrepreneur or 'fixer'. Those members of the population who were

clearly dependent and could not provide for health services out of their own pocket were enabled to receive medical care through publicly organized or subsidized insurance schemes: the old, poor, migrants, and other special groups. At the same time, the government also had an enabling role in encouraging private initiative in health services, in what was becoming known as the 'health care industry'. Medicare was organized through the profit-making and non-profit-making health insurance agencies. Profit-making nursing homes, home health services, private laboratories, sprang up in response to government spending. Some professionals have incorporated their services into private groups: physical therapists or respiratory therapists, for example. But all independent health practitioners have benefited in some way from federal largesse.

One result of the Great Society programmes in medical care was enthusiastic endorsement by private organizations who saw the potential for profit-making at government expense. Not only did the number of private nursing homes rise rapidly, but hospitals added staff and equipment, and physicians' fees increased. But a second result was a patchwork of overlapping medical care programmes, with resulting problems of waste and inefficiency. Spiralling rises in government spending were accompanied by relatively little cost regulation.

In this situation of government involvement without accountability, medical care became a vast, disorganized industry which now employs four million people, spending each year an average of over $500 for every woman, man, and child in the country. Moreover, the costs continue to go up rapidly. As the impact of the Great Society programmes took full effect, it was not surprising that Congressional Committees grew tougher. A short period of expansion was rapidly followed by one of recrimination, breast-beating, and retrenchment. Instead of enabling the private health sector to expand further, the Congressional mood has shifted to repression and regulation of health providers in an effort to develop cost controls.

There is now also abundant evidence of maldistribution of resources, and inequality in the receipt of medical care in the United States, apparently exacerbated by government activities, including gross discrepancies in some instances between society's 'haves' and the 'have nots'. As a result, the word 'equity' has appeared as an additional trigger for congressional debates. Since cost control implies the development of standards and priority-setting, and equity

presupposes some principles of fairness or egalitarianism (and the means to carry them out), the United States is being forced to face questions which are quite similar, substantively and ideologically, to those of any 'Welfare State'.

In any event, the third stage of government involvement in American medical care since the Second World War is one geared towards regulation of the still largely private medical care sector: non-profit hospitals, profit-making nursing homes, private medical and other practitioners. Since the late 1960s, congressional committees have become increasingly concerned about fraud and abuses in Medicare and Medicaid, not only by patients but chiefly by providers. The new development of an extensive system of Professional Standards Review Organizations (PSROs) is designed to monitor the extent of care and the cost of care given to patients in hospitals under public programmes. Government has become much more concerned over the distribution and organization of medical services, and the new health systems agencies are designed to review and monitor health services on an area-wide, local basis.

In ideological terms, what is now happening in the United States may be similar to what happened in Britain during the discussions which preceded the NHS. The situation in wartime Britain in generating the NHS may be paralleled by the current chaos in public programmes in America, by discoveries of widespread abuse, rising costs of medical care, and the lack of public accountability. In this sense, there is a strange quality of *déja vu*. While Britain is struggling generally to revitalize its profit-making sector, and, as a result, is downplaying the role of the welfare state, we are searching for our own welfare ethic. However the term is defined, the government role in medical care in the United States has already become so potent that some guidelines are becoming essential.

As in Britain, the present government role in the United States may be classified under the headings of 'financial management' (a role which will increase if we finally adopt national health insurance), 'distribution of resources', development of 'standards', and 'regulation'. In these respects, the government role in the United States is much more similar to that in Britain than was true even thirty years ago. Naturally, the question arises whether—and how far— the two systems may ultimately be similar.

Are governments moving in similar directions? In some ways, yes

The developing government role in Britain and the United States does suggest some convergence. It seems clear in the future that governments will be responsible for assuring a minimal level of health benefits to the whole population; for keeping a lid on total national spending for medical care; for defining priorities in the medical care system; for ensuring an organizational framework through which medical resources can be distributed across the population with reasonable equity; and for training an appropriate number and mixture of professionals. Given the pressures of modern specialized medicine, government clearly has a role as paymaster, policymaker, and regulator, whether there is a national health service or not.

It can also be argued, up to a point, that medical care poses certain common dilemmas for government, which may ultimately lead to similar solutions. The demands of medical technology certainly require some common answers. Modern medicine has flourished because of specialization: specialization in research, specialization among members of the medical profession, specialization of function in the development of new health professions, and specialized hospital departments and clinics. But no specialized service can work well unless it is well organized and efficient: and it is here that government is drawn in. There must be co-ordination among the specialists, plus access by patients to the system so that they can reach the appropriate specialist; otherwise the value of specialization is lost. On both sides of the Atlantic, such considerations lead to discussions of primary care, family practice, health centres, and specialist groups.

Concentration of specialized services, manpower, and equipment in major hospitals inevitably leads to considerations of regional or area-wide hospital services. Area-wide planning and the idea of community-based health care systems also appear on both sides of the Atlantic. As remarked, area health authorities in the United Kingdom are in some respects remarkably similar, at least in concept, to the health systems agencies in the United States. Both are developing through public funding and government initiative.

In both countries, too, there are movements to decentralize the management of medical care to local agencies, and to recognize the

role of private decision-makers. The NHS has always included boards made up of private citizens. But the development of local health councils purportedly representing the 'consumer' has added another feature; they take the nationalized service another step away from the streamlined, standardized public agency. Meanwhile, America is relying increasingly on groups of private citizens to take on government responsibilities (Boards of Health Systems Agencies are a case in point). On both sides of the Atlantic, then, we see an emerging governmental role whose primary impetus appears to dissociate government funding of medical care from strictly governmental management. Control by politicians and civil servants of day-to-day decision-making in medicine is not on the horizon in either nation. Yet the ultimate checks and balances in the public and private sectors are not fully developed yet. Indeed, movements in each country raise fascinating questions of the accountability of government for public expenditure. Already, though, it seems clear that while governments may delegate responsibility for managing medical services, delegation has to be accompanied by increasing government regulation. In this sense, too, the British system, based on management of a public system, and the American system, based on regulation of a private system, promise to become more similar.

On the face of it, then, there are growing affinities in the government role in medicine. Despite very different ideologies towards medical care in Britain and the United States, the technological forces of medicine—leading as they do to decisions about the cost and organization of medical care—do suggest some common developments.

Yet 'government' and 'medical care' will continue to have variable meanings. It is altogether one thing, to spy broad-brush similarities in the organizational roles of government; quite another to deduce from these that eventually the British and American medical care systems may look the same. As my final theme, I want to stress that while there may be increasing parallels between Britain and the United States, these parallels exist only up to a limit.

It may seem over-obvious to remark, especially to this audience, that medicine is only part technology, and that a good part depends on cultural norms and social traditions. But while the point may be obvious, it may also need stressing. The term 'medical care' means something quite different in Britain and in America; and, I think,

this difference will continue. Moreover, the proper role of government is defined quite differently. 'Government' and 'medical care' can only be viewed in relation to given societies. Technological expansion and cultural systems each exert their own strong pressures.

The American governmental role is distinguished by rhetoric that the federal role should be weak. Yet there is a strong federal role in setting standards for private industry, including drugs, compared with Britain. American society accepts unquestioned a strong governmental regulatory role; indeed, American industry is remarkably responsive to pressures for standardizing industrial techniques and labelling products, whether they be dangerous drugs or breakfast cereals. Reporting of information to federal agencies by government units and by private industry is much more stringent than in the United Kingdom. In Britain, there is, on the face of it, strong centralized direction in all economic sectors. Yet, there is also pride in 'muddling through': decisions tend to be taken informally and independently, both in government and in industry (13).

These practices spill over into the government role in medical care. The American governmental tradition discourages any appearance of a national health service but allows for tough federal controls on hospitals and physicians. In Britain, on the other hand, a national health service is readily accepted, but there is resistance to detailed standards, reporting, and monitoring of services.

Such differences are not academic; they are readily visible. To British eyes, American hospitals, physicians, and health care organizations are remarkably closely regulated. Private groups of physicians work on behalf of the federal government in the new professional standards review organizations (PSROs). These PSROs are developing computerized sets of information about the diagnostic and treatment methods of individual physicians with respect to hospital care of patients in publicly subsidized programmes: approximately one-third of all general hospital patients. These profiles, together with special studies, will go directly to Washington. Physicians' fees and increases in such programmes are already closely monitored, and patients staying in hospital beyond a specified number of days for each condition are automatically tagged for review as to whether a prolonged stay is really necessary.

Even in areas outside the narrow confines of public programmes, strong regulatory patterns are evident. American general hospitals, while largely under private ownership, are under almost constant

inspection from public licensing boards or quasi-public accrediting agencies. Complicated formulae are being developed for approving the building of new hospitals or nursing homes in each state, or major expansion of existing facilities. Decisions which in Scotland might be taken on a common-sense or rough-and-ready basis are translated to industrial type complexity.

In contrast, of course, to American eyes medical care in the United Kingdom seems oddly under-regulated; its standards unspecified: its techniques for planning under-developed; its lines of responsibility muddied with committees. Running expensive health services by boards of health service employees working in committee is as alien a concept to American eyes as detailed 'peer review' may be to the eyes looking in the other direction.

But if governmental roles and styles are different, so too are perceptions of 'medical care'. In the United Kingdom health services have a holistic meaning. Health, like housing, is a social service accepted as such by both government and the population. It seems logical that social workers should work closely with health workers at the local level. Patients do not hesitate to ask their family doctors about housing conditions, meals-on-wheels, or residential care, and family doctors expect to have at least some knowledge in these areas. Such an interlocking of personal care services is virtually unknown in the United States, where efforts to deal with mundane aspects of everyday life have been confined largely to a few experimental health centres for the poverty-stricken; survivors from the War on Poverty of the mid 1960s. Middle-class America does not expect its doctors to find wheelchairs, nursing homes, or placement for an invalid patient; there are numerous other agencies to do these things for the poor; the middle class are expected to rely on their own initiative. Medical care in America is limited and technical.

For most of the population medical care in the United States is not an expected service but a purchasable commodity. In many union negotiations, the increase in health benefits may be as important to the union members as actual cash increases. In this sense the market operates, and individuals and organizations offer medical care—or at least provide care and health insurance—as an alternative to some other good.

While financial risks are usually shared through health insurance, there is no such thing as 'comprehensive medical care' as it is understood in Britain. There are neat, often cryptic lists of benefits made

available under specific health insurance policies (for example, so many days of hospital care for specified conditions, with the insurance covering 80 per cent of expenses up to a specified sum). Physicians hold out their services for a fee, reinforcing the purchasing image. Angry patients sue when they feel cheated in these transactions—whether righteous, disappointed, or merely unrealistic—as they would in purchasing expensive merchandise. The system of medical malpractice, now under chronic stress, vibrates with the buzz of litigious patients; in large part because of the continuing commercial imagery of American medicine. Medicine is seen as but another part of the market system.

These distinctions are not merely a result of a post-war welfare state in one society, the lack of one in the other. They go to the heart of the way in which medical services have developed. Richard Titmuss, in his book *The Gift Relationship* (14), described blood transfusion services as a symbol of cultural differences in society in each nation. But even in the nineteenth century British medicine had a flavour quite distinct from its American counterpart, and these distinctions have survived the ideological debates.

There is a danger in oversimplifying what were in fact complex events, but two examples illustrate the distinctions. The first relates the concern about 'exploitation' in medicine in the late nineteenth century. In Britain the concern centred on the exploitation of physicians in 'contract practice' with public and private agencies; in America, there was more concern about exploitation of the public by physicians; a concern which has surfaced again in the unmasking of doctors who have cheated public programmes by making fraudulent claims on Medicare or Medicaid. Advertising, kickbacks in the form of fee-splitting, holding out as a specialist in dubious fields and other forms of greed, were engaging professional leaders in debates about the apparent 'commercialization' of the medical profession, a word which does not appear to have been important in discussions in the United Kingdom.

The second example of the distinctions between United States and United Kingdom medical care relates to the development of hospitals. From the 1870s and 1880s until the First World War, hospitals sprang up in America to provide surgical care for middle-class Americans. British hospitals were, on the whole, of an older, charitable tradition, owing their primary allegiance to the more numerical working class. Basically the British hospital, for all its

faults, came out of a tradition of care for the dependent; while the American hospital, warts and all, grew up to sell a professional product; surgery in the new gleaming operating rooms.

There are, of course, many other distinctions in the professional development of medical care in the two countries: the role of the primary physician, different developments of the two nursing professions, of dentistry, and of other institutions. The point to be made here is that even before national health insurance came to Britain in 1911, the character of medical care in the two countries was quite different.

Medical care has continued to have a different connotation in Britain and the United States. British visitors are constantly surprised at the relative disorganization of medical care in America, the onus put on the consumer to select a doctor, 'shop around' for care, the assumption that the best medical care in the world is available providing you can pay for it. American visitors to this side of the Atlantic are suprised at the degree to which health services are accepted as an integral element of cultural life, and are sometimes alarmed at relatively inferior physical facilities: no deep-pile carpets on office floors, the folksy simplicity of some GP surgeries, the willingness of the middle class to sit for hours, if necessary, in cavernous and dismal out-patient departments, and the assumption that the British consultant, like the British judge, is the only person in the drama whose time is valuable.

British visitors to America may in contrast be surprised to find that even in the new, consumer-oriented middle-class health clinics, the so-called 'health maintenance organizations', the emphasis is on luxury, marketing, and salesmanship. In Britain there is little questioning of the assumption that excellent care can be given in terrible surroundings. Indeed, there may be some perverse pride in making-do in draughty basements. Not so in the United States. No self-respecting health maintenance organization would open its doors without hotel-type furnishing and the latest in equipment, even if the results in costs or services will inevitably be high. The commodity orientation of medicine has struck even here.

Some of these may be surface differences, of course. The actual care given to an individual patient with a given diagnosis may be quite similar. Nevertheless, the distinctions are by no means frivolous. It is a matter of considerable importance in untangling the various relationships between governments and medical care to

recognize that medical care has no constant definition. The phrase encompasses no single package of attitudes or benefits.

We end, then with a recognition of both similarities and differences. In the long history of medicine in Scotland and in the United States, advances in medical science have been shared freely, while transatlantic travel has stimulated both medical professions. Yet the government role in medical care developed quite differently. As medicine has become more specialized, costly, and complex in each country—particularly in the past thirty years—each nation has been forced to grapple with similar problems. In some respects, the answers may also be quite similar. But the comparisons must not be strained. There is an enormous difference between a medical care system based on public management and one based on regulation of private agencies, and there promise to be continuing differences in the definition of medical care as a social service on one side of the Atlantic, and as a commodity on the other.

Now, as in previous centuries, there is no general rule for government involvement in anything save, perhaps, a rule of general expediency and the hope that whatever government does, it will not do mischief (15). But if there is no common principle about what the government role will, or ought to be, in medical care, let us at least celebrate our achievements and learn from our distinctions.

As first steps, the United States may benefit from Scotland's experience in running a medical care system, if only by contrasting the limitations and potentials of area-wide planning by American HSAs with health boards in the NHS, and by comparing in medical care regulation, including what is rather horridly called 'quality assessment', computerized reporting systems and medical audit techniques. But there are many other areas for constructive comparisons. As previous centuries have demonstrated the fruitful interchange of ideas, knowledge, and skills in medical education and research between Scotland and the United States, the future may be marked by our abilities to appreciate the most interesting elements of each medical care system. With our vision unclouded by presumption about what government ought or ought not to do—and recognizing, too, that our vocabulary is not always readily interchangeable—may we learn from each other with respect and humility.

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12

Government influence on health and medical care

GORDON McLACHLAN

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The imperatives of government

It is axiomatic that governments have a strong interest in having their peoples healthy. There are powerful grounds for this. The economic, if no longer part of, have never been far behind the military imperatives, and it is already evident in the present atmosphere reigning in the United Kingdom that political decisions on health are powerfully influenced by social and corporate pressures. One of the reasons which used frequently to be given for the institution of the National Health Service was that in the long run the health of the nation in all respects, would best be served by the better organization of personal health services which *inter alia* would allow access to them to be uninhibited by economic and social barriers, a high-minded social objective not confined to the so-called welfare states. Such an observation was of course in the heady post-Beveridge days when universal welfare and its various essences were distilled from post Second World War sentiments everywhere. Since then, the arguments for better health policies on the part of government have become more sophisticated—if somewhat more diffused; and if perhaps there have been recently signs of a more realistic appreciation of the relatively minor part personal medical services play in the health status of nations as compared with the influence of behaviour and the environment (1), and if it is true that policies for special support for acute services can still be argued on the grounds that these are designed principally to maintain the source of much economic health, for example by restoring the able-bodied worker to good health as quickly as possible, it is also apparent that sentiment, social and political, is powerfully on the side of government action designed to improve on both ethical and aesthetic grounds the

hitherto less satisfactory aspect of comprehensive care, the 'maintenance' services for the elderly, the mentally ill, and the handicapped (2).

Government as agent of reform

There is a long complex history of government influence on health care in Britain evidenced in a series of enactments beginning in the nineteenth century aimed to improve the health of the public. These have been traced largely to the implementation of Bentham's ideas. (It is worthy of note that the greatest promulgator of Bentham's ideas in England [*sic*] was James Mill the utilitarian philosopher, a great son of Edinburgh and its University.) Many of these appeared in his *Fragments of Government* and later *Principles and Morals of Legislation.* The results are seen in changes in the machinery of central government including the establishment of a Ministry of Health to focus attention on health matters at the apex of Government, the reform of local government to ensure community initiatives, the new Poor Law, and some public health measures including some important legal codification. The 1858 Medical Act was concerned with quality, being a statute designed to ensure better standards of education and conduct for doctors practising medicine, and the General Medical Council was set up to regulate these.

The history of public health subsequently is associated with the names of a band of reformers whose influence in provoking government action is impressive in retrospect; but they were above all highly individualistic men who none the less felt it necessary to press for collective action by government to ensure necessary reforms. These included Chadwick, Simon, the Webbs, and Newman, during a period notable both for private enterprise and the emergence of a policy for its regulation, since it spanned the period from the Reform Bill till immediately after the First World War.

The dawn of the systems approach

Newman himself shortly after the inauguration of the Ministry of Health in 1919 restated an earlier Victorian inventory of health in eleven postulates:

1. The housing of the people and the planning of towns.

2. Industrial welfare of the worker and supervision of his workplace.

3. The care and supervision of maternity.

4. The health of infants and children, including a school medical service.

5. The treatment of the common infectious diseases.

6. The treatment of constitutional disease; tuberculosis, venereal disease, cancer, rheumatism, lunacy, blindness.

7. The provision of the means of such treatment, hospitals, clinics, sanatoria, special schools.

8. A national health insurance system.

9. International Sanitary Convention.

10. Medical research and investigation into causes and prevention of disease.

11. The education of the public in health.

It is interesting that some of these indicate the need to place health in a wider context than improving medical care organization, an objective which has tended so much (and continues) to dominate the health scene in the last thirty years or so, sometimes to the virtual exclusion of the more holistic view of health taken by the early reformers. Yet these postulates are often forgotten, and more attention is usually given to the Dawson Report published in 1920 which ushered in an era of Government action, at first albeit tentative, on the organization of medical care (3). This report was in response to the terms of reference given by the Minister of Health to the Minister's Consultative Council on Medical and Allied Services, chaired by Lord Dawson of Penn, viz:

> To consider and make recommendations as to the scheme or schemes requisite for the systematized provision of such forms of medical and allied services as should in the opinion of the Council be available for the inhabitants of a given area.

It has to be noted that this charge emphasized the systematization approach. It says nothing about 'health' in the widest context, or health improvement: and indeed this somewhat metaphysical concept, strong in the Victorian reformers' minds, seems to have been gradually submerged in the subsequent emphasis on systems, given a special boost immediately post 1948 by the acronym 'NHS'. Nor did

the recommendations of the distinguished Committee seem in fact to have stimulated much immediate government action. Indeed, little political and legislative action was taken in the following twenty-five years except in the policies which enabled local authorities to develop hospital and associated services after 1929. Even then there seems to have been some diffidence about the role of government and its effect on services except interestingly enough in the field of clinical and scientific research following the setting up of the MRC; and the concordat between the MRC and the Ministry of Health gives an insight into contemporary thinking on this issue (4).

When the Nuffield Provincial Hospitals Trust was formed in 1939 with the specific main purpose of helping to co-ordinate the hospital and associated medical services in the provinces, such an objective seems to have been reckoned still to be one for a private enterprise operation. There was a spurt of government interest and action, albeit of a somewhat cautious character, during the Second World War; and it is perhaps significant that the survey teams which produced the so-called Domesday Books of hospital services were appointed jointly by the Ministry of Health and the infant Nuffield Provincial Hospitals Trust (5)

The NHS and the effects of regulation

The 1946 NHS Act is often seen as the major watershed of Government intervention in medical care affairs. In effect it is a relatively but classically simple measure for enabling Government support to be given on a national basis to rationalizing and improving the organization of health and general medical services based on geographical areas for administrative purposes, but on the assumption that medical practice would go on much as before. Thus the three branches of the system established by the NHS Act of 1946: general practice, hospital and specialist services, and local health authority services virtually encapsulated and propped up the existing system. Like all measures of its kind it did of course envisage and provide for regulations over and above the Act itself. There was a real fear on the part of the medical profession of what these might mean to medical practice and the Minister of Health was constrained to give many soothing assurances publicly, as well as on the floor of the House, that there would be no government interference in practice (6). In the event there were relatively few acts of direct central

government interference likely to affect the practice of medicine which can be deduced from the NHS Act itself. At the same time, the implicit threat arising from the need for public accountability as a result of the large and ever-increasing injection of public funds especially into the development of hospital and specialist services created a mood of uneasiness on the part of some practitioners, capable of being activated not infrequently into something worse. The introduction of nationally fixed scales of payment perhaps has had in it more seeds of discontent in a period of national expansion and more recently extreme inflation. Increasingly, too, since 1948 the regulations formulated to administer the complex of health services in the NHS including edicts by circular have grown massively, with a corresponding increase in bureaucratic requirements. This has inevitably also affected the atmosphere in which medicine is practised, since the services rely for development as well as maintenance on public finance. Indeed the move from the previous pluralism to a centrally regulated and therefore more bureaucratic system developing a mass of rules has been a special feature of health services in the United Kingdom.

The waning of the voluntary influence

Government policy too has tended to damp down the voluntary effort which was a relieving feature of the previous arrangements. Not only were sessional fees introduced for all consultants practising in hospitals, and capitation fees for GPs for all patients registered, but the intoxicating impression from the promise of 100 per cent government finance quickly permeated the system. Thus if there are few restrictions now on initiatives being taken within the health service framework to involve external financial support to develop or even prop up wilting services, there is still a strongly held view that the state should overwhelmingly provide for more services; and there is little room for local initiatives on any scale. Indeed in the earliest days, forays by hospital authorities to seek financial support externally, were invariably discouraged, and it was only with the formation and encouragement of the development of the Hospital Friends movement in the 1950s that this mood started to change to any degree. There has always been government encouragement for one particular aspect of voluntary work—membership of boards and authorities—but the numbers of citizens directly involved thus were

drastically cut down by the Reorganization Act of 1973: and the removal of this special non-bureaucratic yeast from the administrative set-up has yet to be assessed; and could in the long run be a matter for regret as possibly an important element in the liberal interpretation of official rules.

The development of a policy for the attraction of that other yeast in the working parts of the system, voluntary workers, in the health services has been slow, because of the traditional fear of organized labour of the effect of such workers in bargaining issues. There is currently, however, a change in attitude (6) and the arrangements are being co-ordinated by the appointment of professional voluntary work organizers and liaison officers. The recent realization of financial restrictions in the development of health services has probably given voluntary work a boost. Thus the Labour Secretary of State, Mrs Castle, made a powerful plea in November 1975 (7) for the encouragement of voluntary work in health services; which is somewhat of a *volte face* in relation to earlier Labour Party dogma expressed through government policy which tended to underline the necessity for developing professional staffs at every possible level, and depreciate the need for volunteers.

Effects on practice

At the practitioner level however it is doubtful if there is real evidence for any attempt at direct interference by Government in medical practice, other than those in conditions, particularly those posed by the threat of financial sanctions to implement priorities which, while real enough in the near-monopolistic conditions of the NHS, has not until recently been all that significant hitherto. Clearly the centralization of budgetary control has had a particular frustrating effect in restricting local initiatives dependent on finance from the system in support of particular services not receiving high priorities at a higher level. More recently the political decision to exclude private practice from NHS hospitals (8) has changed a condition, the emotive effect of which is out of proportion to its relative importance in service expressed statistically, but it raises the question whether the political and corporate exchanges which have resulted will affect morale and the quality of medical care in the long run. Scotland seems to have escaped the worst of this. It hardly seems, however, to threaten, at least in theory, how medicine is

practised. It does, however, indicate how a government policy formulated centrally can affect what kind of services are available in particular areas, since the measures proposed include the use of bureaucratic sanctions to thwart the provision of facilities which do not accord with what is seen at a higher level of decision, as public policy for a particular geographical area. Yet this is surely another manifestation of planning logic, even if it is overlaid with emotion about the restriction of liberty.

The paradox of government action and personal liberty

There is of course a paradox on the attitude expressed in the thesis 'the Government ought to do something' (to correct some fault or fill some gap in the system) and in the fear that government action of any sort is bound to infringe individual liberty.

Thus, Mr McIntosh has referred to the change in medical attitudes to management as a result of the effect of a State system.[1] In Professor Wilson's outline[2] he refers to the role of government in encouraging (and in controlling) educational development.

These illustrate the contrasting aspects of government influence on health and medical care. On the one hand is the consequence of the demands for personal service, in response to which government initiative can be geared to support established medical practice in the treatment of individual patients. On the other is the sometimes disquieting effect of direct government initiatives on economics, education, and public health, where although government action does not directly effect the independence of individual citizens *qua* patients seeking care, the State nevertheless has the initiative and the power to affect the way in which the individual doctor behaves towards the patient by way of the kind of institution, or services through which he exercises his professional skills. Even then there is no general agreement about the implications of such external constraints on practice, since it depends on the stance from which one views the complexity of modern society.

The road to priorities not just an issue for government

The Minister of State for Health, Dr David Owen, in a speech last year (9) argued that while a major aim of the NHS Act was to

1. See paper 9. 2. See Appendix, pp. 193–4.

establish access to health care resources to all in need, the lifting of financial barriers not only benefited patients but also enhanced doctors' clinical freedom. In the remainder of the paper he referred to the variations in the characteristics and quality of service which were offered within this freedom and drew the moral that freedom incurs responsibility—and in particular the responsibility of choosing priorities. In this respect it is interesting to muse on Mr McIntosh's observations about the effect of the prospect of state finance on the practising clinician. The enhanced clinical freedom which the constancy of finance from an assured source confers on doctors within the NHS has certain limitations in that there is added a different and complex set of values which affect individual behaviour in a variety of ways.

The development of services to a national plan has taken place in an era when not only does society demand a wider distribution of welfare on a basis seen to be fair, but due to technological development, medical care itself has become increasingly expensive and there is competition for resources between specialties and between health authorities each of which is certain of the righteousness of its claims. Although under the NHS it seems that there has been more systematized control over expenditure on health care than under the various insurance systems extant, few anywhere in the world today question the need for tighter control on the use of resources. As governments are called upon to pay more, ceilings of expenditure are likely to be the rule.

The implications on education and manpower planning and research

What is the implication of this in the field of personal service? Much of the service summoned up for patients, including the prescribing of drugs, is open-ended if the doctrine of clinical freedom is applied to its logical extreme, unless there are outside constraints. As far as the rest is concerned although the service authorities are subject to control in relation say to capital expenditure and manpower development, they are nevertheless only indirectly guided by government decree. The implications of this on the practice of medicine and particularly on medical education are profound. It is not inconceivable as a matter of policy that eventually medical education may be so directed as to instil in students not only a respect for

scientific truth in the biomedical field, but an equal respect for the economics of resource allocation, to which doctors reared in the pre-1948 world of private medicine were very much alive, in that the scale of care was generally geared to what the institution or the individual could afford, not, as now, to the wealth of the community at large.

Indeed it is not too far-fetched to see a case being made out in the future for government policy to insist that the doctor be educated about the implications of the system in which he works as well as to make him literate about social and economic affairs in relation to health. Not only is there wider recognition of the fact that the doctor shares responsibility in the field of personal medical care with the nursing and other caring professions; but there is also a claim that his sphere of action extends into the wider panorama of a total health system involving behavioural and environmental issues as well as complex relationships between central and local government and the individual. The social work departments, the education departments, and most of the other institutions which provide social services relevant to health but own no allegiance to the health departments influence both the health system and the health of individuals. Moreover there are the voluntary services which become the more important where the State itself has to impose tight restrictions on the allocations of revenue. Each of these has its place in the scheme of health affairs.

It is not difficult to see the hardening of the argument that the individual who needs personal services, and the institution requiring counsel on health policies will only receive the best quality of service when all these sectors are working in a co-ordinated manner with mutual understanding of each others' responsibilities. To achieve a satisfactory relationship between government and medical care, the doctor both in his student days and later in his continuing education, needs a full understanding of social and economic affairs. Some may get their bearings as they go along by native instinct or enthusiasm, but is it likely the policymakers will for long regard this as sufficient in a world in which priorities are decided? There are educational requirements here which, it is not difficult to see, may attract the support of not just the ideologues but of the management experts, commissioned to rationalize the system.

To turn to the other end of the spectrum where government has a direct responsibility and the power to implement decisions, as has

been alluded to in Professor Wilson's notes, the power to finance education is of no small consequence. Both the omission and the commission of particular programmes will have a decisive effect. At the present time in this country the universities and medical schools while still resistant to outside influence from any quarter have a patronage power in that once admitted, the normal student has almost an assurance of a career, in distinction to many other students who have to choose and to compete after graduation for employment. Since the establishment of the NHS, one of the characteristics of the British situation is that the NHS has appeared often in the past to react to the supply of medical manpower, in contrast to some public services which offer an established limited number and variety of posts for which applicants compete in a free market. In a period of restriction this position on resources will almost certainly change, as it seems to be changing in the field of state education. Indeed the calls for joint action on public social policy may bring about not just changes, but more government influence (10). Thus the abolition of discrimination between men and women students competing for admission to medical schools which is the latest manifestation of the emancipation of women may have an effect upon the future shape of the NHS, as well as raising the total cost of education the likelihood of which is unlikely to escape the sleuths assessing public policy especially that concerned with economics and manpower. Thus if the effective working life of a woman doctor is say 70 per cent that of a man, the medical work force in the near future will have to be discounted accordingly. This of course is not a phenomenon unique to Britain and indeed the problem here is perhaps less acute than that arising from the system obtaining in a number of European countries, where there are fewer restrictions than in the United Kingdom on the number of admissions to medical schools because of the presumption that any student has the right if he or she has the qualifications to be educated according to his or her first option, even if the later competition for suitable employment is more fierce in consequence.

Indeed in the little-researched field of staff recruitment, pay, and conditions of service there is another respect in which governments do have very great power to vary some of the important elements in the system of care. If one looks at the United Kingdom, it is seen that policies incorporated in the general practitioner's Charter or in the Salmon restructuring of the nursing profession or in recruitment

of immigrant doctors may well have affected the pattern of health care. It may be at the present time that the restructuring of junior doctor's pay and its repercussions on the relationship to consultants' pay have an influence on the quality and the shape of health care arrangements in the United Kingdom in the future. The fact too that this area has had little attention from researchers reflects its sensitive nature, and this raises what is likely to be an acute problem in itself, namely government influence on health services research (including OR) generally. At present the near-monopoly which is enjoyed by the government in this field, poses questions for the future if as is generally supposed the field of policy is one which by some implicit agreement seems to be largely ignored by potential 'customers'.

Indeed the necessity for a return to a more holistic view of health is supported by the assessment of research findings and more research is called for (11). If the picture of direct government influence on medical care expressed either positively or negatively is a little muzzy (but certainly not conspiratorially malignant), government in the United Kingdom seems to be somewhat purblind to the relative effect of the major determinants of health, environment, behaviour, and the genes. Yet there are major government policies relevant to most of the influences on the health of the individual, particularly that on the environment including citizen behaviour. The vast field concerned covers pollution; stress; toxicity artificially created within the environment; infectious disease; and dangerous behaviour; information or misinformation through advertising and educational services; fiscal and other government influences upon consumption; and so on. The common factor in all these is that government policy can be influential and be made effective (up to a point) by government legislation or administrative decree. It thus constitutes a direct threat of interference of government with the individual and is ethically justified usually by what is regarded as the certainty of scientific knowledge, and the extreme nature of what could be the outcome, if there was a doctrine of complete *laissez faire*. There have of course to be powerful constraints on collective imperatives, however well-meaning. A Trust publication in 1968 (12) pointed to the ethical and effective distinction between desirable processes of diagnoses initiated by patients, and no doubt equally desirable processes initiated by doctors or officials. There has been little philosophical consideration given, however, to the nature of the restrictions which

should be placed upon government action. In Britain the fluoridation controversy, the debates over crash-helmets and seat-belts, the excitement over the control of rabies and indeed the continuing discussion of the pros and cons of nuclear power station policies: all of these illustrate the difficulty of the problems which arise in deliberating over controls which could be instituted by government for the assurance of better health, at a possible disadvantage to economic or cultural values.

It is of course now evident because of the restrictions of finance and the sharpening of the case for the better use of resources that the way has been opened up for a much more professional approach than previously, to the development and planning of services. As a consequence most of the major issues involving confrontation with individual and institutional interests arising from central government control of policy concerning health services and the other influences on health are slowly rising to the top. Particularly this applies to philosophical questions expressed in such terms as the 'good of society against the individual'. Thus, because of the immense financial stake government has in medical care itself, not only are its practitioners and scientists tending to be interested in economics and priorities to ensure the optimum use of resources, but by reason of the imperatives of accountability, governments are being drawn into what are really complex questions of quality of care with all its attendant emotive considerations. That the acronym PSRO has been wafted across the Atlantic without an attendant knowledge of its cultural origins or widely recognized limitations, is an indication not just of the fitfulness of wind directions but of the danger of oversimplification of the quality issues (13). The potential influence of government through direction of resources on 'structure' of services gives enough food for thought without the certain provocation if there is any ill-conceived debate on 'process' governance, or 'outcome' assessment.

Postscript on governance, government, and liberty

To take a panoramic view it is incontrovertible that the influence of medical care services on health generally is relatively small compared to that arising from environmental influences and personal behaviour which are affected quite considerably by government action in a number of sectors. The complexity of this is very great and needs to

be constantly assessed and appreciated by the health professionals as well as by government policymakers.

In the case of environment the many questions which arise and for which the Department of Health and Social Security has little or no say or indeed where the administrative and political arrangements either exclude medical considerations, are formidable and only slowly becoming widely understood.

In the case of personal behaviour the use of taxation and subsidy devices to influence personal behaviour in relation to food, alcohol, and tobacco are only now being assessed in a preliminary way piecemeal, far less explored rationally. Some recent government decisions, for example through EEC agreements on cheaper butter seem to have been taken without consideration of their influence on health at all; which is strange considering the equally recent debate in the health context, about unpolysaturated fats in diets.

Yet for all the arguments about the effect the establishment of a National Health Service, or of categorical programmes such as Medicare and Medicaid programmes, or of National Health Insurance schemes, it is questionable if the arrangements for the structure of health systems have as much effect on the health of populations or even on individual treatment or practice than is often supposed. If there are some measurable results which can be assessed from the complete range of government action from the experience of complex organizations dealing with health care to the many environmental matters within the purview of government action, is it not the particular responsibility of the medical profession secure on its bastions of education and culture to take a leading part to influence government policies? The time is probably now.

The over-all position can, however, be obscured by an obsession with a false image of government interference to the exclusion of a consideration of the principles of which should rule in intervention from any authority. There is need for a much more integrated and seriously considered general philosophy about governance of health care arrangements in relation to the freedom of the individual against the limitations he must be subject to because of the increasing acceptance of the doctrine of the 'collective good'. It is not only that if governments play too great a part through the use of multitudinous regulations, there is a tendency to flout these and so introduce the specific anxieties involved in law-breaking. There is an inevitability about the growth of regulation of practices in any large-scale

bureaucracy public or private applied in order to establish safe lines of accountability. To nourish the sense of freedom needs constant vigilance, well beyond the safeguards of present laws or complaints procedures or the protective role which has been conceived for the Ombudsman.

It may be that we will have to promote a return to the basic role of government as protectors of individual liberty, the importance of which was recognized so aptly in these words by John Stuart Mill: '. . . the importance, to man and society . . . of giving full freedom to human nature to expand itself in innumerable and conflicting directions' (13).

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APPENDIX

Skeleton of proposed paper on *The influence of government on medical education*

BY PROFESSOR GRAHAM WILSON

who was prevented by illness from writing and submitting the paper

1. Influence of government on university medical education long-standing. Historical note—Chair of Medicine at Glasgow established 1637, its suppression on report of a Scottish Commission in 1644 and its revival only after the Act of Union in 1712 by Crown Patronage.

2. Medical Act of 1858. The production of a qualified general practitioner to be tested by examinations. The subsequent dominant influence of examinations on British medical education.

3. The Medical Insurance Act of 1911 and the separation of the preventive and therapeutic services. Subsequent difficulties in teaching preventive and social medicine and in interesting high-quality medical students in these subjects. Present attempts to bring the services together under reorganization.

4. The NHS and its influence on recruitment to university teaching posts in the clinical subjects. Dependence on NHS-appointed staff for much clinical teaching.

5. Undergraduate medical education. Overwhelming influence of government on medical student numbers through the UGC and official committees such as Willink Committee, Royal Commission on Medical Education, etc. Influence of GMC on medical education. Power of the government purse in the provision of facilities.

6. Postgraduate medical education. NHS and the conflict between service and educational needs. The phasing of postgraduate training and the junior staffing structure. The numbers in training. Influence of MRC on postgraduate medical education.

7. Present relations between government and British medical education. Some current problems.

8. Inevitability of close concern of any government with medical education and consequent importance of the relationship between politicians and educators. Essential that decisions should be based not on opinion or expediency (a real danger in these circumstances) but on knowledge and principle.

Additional questions under consideration were:

9. The inevitability of government involvement in medical education.

10. Consideration of medical education as inseparable from medical care in which government involvement is inevitable.

11. Medical education and quality assurance.

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Implications and challenges

SIR JOHN BROTHERSTON

Implications and challenges

The discussion following the presentation of the papers commissioned demonstrated the excellence of the choice of topic for this Symposium. Not only is the topic important in itself, but also it was a spearhead of the discussions into all the main issues of our time, in terms of meeting the medical care needs of our communities.

If I could try to take it in terms of the title of the Symposium, 'Medical education and medical care', we have been concerned to look at the fit between these two responsibilities, to try to identify misfits and to consider what might be done about them. Commenting on a potent point raised in discussion that perhaps the responsibilities might be wrapped up in one authority, I think we are really seeing the responsibilities in terms of a separation of powers, of university and health service provider, and probably assuming that there is some virtue in this separation. But this can also make for difficulties and differences in priorities.

It is, in fact, difficult sometimes to separate what is the medical education responsibility, and what is the medical care thrust. In most of our communities the two things have been so closely welded together for so long that we may sometimes risk a confusion if we try to identify too sharp a separation. We are certainly not concerned to make any slick allocations of guilt if we see deficiencies. At the back of all our discussions we have had a sense of the importance of this process of educating doctors because of the importance of their leadership in determining and shaping how health services develop.

In parenthesis, I would say that we probably have to guard in our minds against an excessive expectation from the educational process. I am not meaning so much in terms of skills imparted, but if we expect an injection of medical education to solve our problems in the

health service for ever in terms of the aspirations and activities of the doctors who go forth, I think we are asking too much of the medical school and its teachers. There are too many other influences at work which may overwhelm the good works of the medical educators.

On the whole, the fit between medical education and medical care has been good. One could say that perhaps this is not altogether surprising because have not our health service priorities been largely a fall-out from medical priorities? This was straightforward enough when we were thinking in terms of the acute problems, when our model was quite simply seen as the acute hospital. We have, I suppose, had half a century of time in which the acute hospital, the teaching hospital, has been the great success story of medical care in the Western world. What we are seeing now is an element of doubt, a time for reappraisal. Some people are asking whether this medical model which all of us have been brought up on is adequate, in itself and alone, to guide us for the future. Are we sure that our medical priorities today are congruent in all respects with the social responsibilities of our health care system?

It has been appropriate that this important subject should be discussed in the context of a celebration of the Edinburgh Medical School's anniversary. This has made sure that we have not been confused by the kind of ivory tower argument which is sometimes brought forward in this sort of context, the allegation that teaching hospitals are ivory towers detached from the world around them and in this way have misled their constituents. That could never be said of the Edinburgh Medical School. Whatever else, for example, the Royal Infirmary is, it is no ivory tower. Over the centuries it has been the main provider of acute caring services for its community, and it is still responsible for about two-thirds of the various kinds of acute patient care in this community. Its motto has been *patet omnibus*, 'open to all'. When it was built, amongst other things that happened, the stones were carried for the original Royal Infirmary by the voluntary effort of citizens, carters, and others who turned out to do this. It has been a community institution from the start.

As we have heard, this medical school has shown other manifestations of community responsibility, with its tradition of teaching dispensaries, and now general practice teaching. Sir Robert Philip, the great tuberculosis pioneer was mentioned in the discussion. It was he who created a fascinating complex of surveillance, social and medical care, of dispensary supervision, and hospital. This was used as one

of the important teaching resources of the medical school for many years. Robert Philip himself was one of the leading consultants in the Royal Infirmary.

That is the kind of background against which we held our discussions. Yet, even in this context of a tradition of community responsibility, the same questions arise as to whether the medical model to which we have become accustomed in the last half century as a guide in planning our medical care system is now sufficient in itself.

Let me try to look at our discussions, first, from the point of view of attribution of responsibility to medical education. We were led here, notably, by Dr Bearn. We reaffirmed with him the necessity of the science base for medical education, agreeing with him that the roots of medical education must be kept alive by the waters of verifiable fact. We agreed that science or service is a false issue; science is necessary to support service. Future generations would not forgive us if we were to lose our scientific nerve, so he told us. But he also warned us that there are other voices raised at the present time. There are voices of doubt raised about the impacts of science-based technology on health systems. Professor Donald told us too that his young men bring him the same message. We would do well to pay attention to this warning. I am not thinking here of the apocalyptic utterances of Illich. There are other people who perhaps know more what it is about, or are certainly in more responsible positions, who are saying something of this kind to us at the present time.

A few days ago I was at the meeting of the European Regional Committee of the World Health Organization. We were addressed by Dr Mahler, the Director-General of the World Health Organization, on the theme of health development for medically affluent societies. He said things to us which he is saying in different ways in all the continents of the world. If I may quote briefly, he said:

> Health development is not synonymous with the development of increasingly sophisticated services in medical institutions. In many countries the value of these expensive institutions can be seriously questioned if measured in terms of their impact on improving the health status of the population. No country can afford to provide every citizen with every possible form of medical technology, nor would this necessarily be good for the health of the individual and of society. On the contrary, quite apart from possible adverse side effects and iatrogenic diseases, it would tend to make people over-dependent on a medical aristotechnocracy.

He also said:

In a number of countries expectations remain consistently high, with respect to individual medical care. These expectations are often aroused to an excessive degree by the medical profession, leading to undue demand. In my opinion, it is the duty of health authorities to provide the public with authentic information on the value and limitations of health technology, and on the rationale for various types of health care, so as to create an informed opinion that will encourage a realistic formulation of health programmes in keeping with the country's social and economic situation.

Few of us would really doubt that there has been a tendency for the growth of medical technology to breed assumptions that more technology must always be better: twice as much must be twice as good, four times as much must be four times as good. This can lead not only to costly expenditures but to dangerous situations.

Thus, we have a kind of responsibility here. Yes, we must be science based; yes, the pursuit of knowledge is the hope of improved welfare for the future, but we have to use judgement in this situation.

At this point, let me make an aside. I have been invited to comment under the heading of implications and challenges. I suspect that 'challenges' is meant to mean 'what can we do about this?'. This immediately brings me into the cricket and sparrow situation about which we were reminded by Dr Bearn.

> ... You will remember the fable of the cricket and the sparrow, which stands as a warning to legislators, reformers, administrators, even professors of medicine. The sparrow was complaining of the winter cold. The cricket advised the sparrow to turn into an insect like him for a few months each year and keep warm next to the hearth. 'A perfectly wonderful idea', said the sparrow, 'How do I do it?' 'Oh,' said the cricket, 'I only *make* policy, I don't *implement* it.'

I want to try to respond to this challenge on challenges without, until I come to the end, adopting the methods of the 'cricket'. If I say that I think something might be done, I hope, however difficult it is, that it is attainable.

Let us think about this, in relation to the use of our technologies in the medical school. We know, as Dr Bearn said, that students want to do what teachers *do*, not what they *say*. If the teacher says certain things must not be done, they are wasteful and so on, but the students see it happening all around them, then the students draw the appropriate conclusion. We must recognize that medical education is partly an explicit process of imparting fact and skill but, in equal measure,

it is a process of creating attitudes and assumptions. We have to think how we can assist in creating the right kind of critical attitude in this sort of situation about which we are talking. We have to think of demonstration models of some sort. In this sense, we are surely thinking in terms of bringing in science to redress the balance about which we are talking. There is an onus on us, in this situation, to demonstrate and to make visible to the medical students that we are assessing what we do, that we are not launching into technological adventures until the impact of what we are trying to do has been assessed.

Incidentally, we could well be humble and say to ourselves that some of our traditional technology could be assessed just as appropriately as the new technology because some of it is at least in doubt.

How do we do this? How do we devise methods of demonstration of evaluation? We know this is difficult, but not impossible. If we look there are examples of what can be done. I recognize the fate of Dr Mellinkoff's Greek philosopher, who lost his sanity trying to define quality. Nevertheless, there is a responsibility lying with us here.

What about the social responsibilities of medicine? In a recurring sort of way, we probably had more discussion about this than on almost anything else. It may be recalled that when Dr Bearn led us on this theme, Sir Andrew Kay asked him what he thought were our social responsibilities in medical education, or our responsibilities to teach about social responsibilities. Can we do this and, at the same time, have the time to educate our young adequately in scientific understanding and the necessary skills?

We are all saying that we do have a responsibility in medical education to introduce our young to the social responsibilities of medicine in the community. But I am pretty sure that we are very diverse in how we would interpret that responsibility. I have myself no doubt that medical care, to be effective, has to be a service geared to the needs of the particular communities served, and that this has social and logistic implications. We are not only insufficient to our young if we do not teach them about this, but we are positively irresponsible and unkind.

Again, thinking of the model idea, if we are going to do anything about this we have to bring young people into an institutional environment where they see the right kinds of things happening, and not just talked about. How can this be done? We must consider what

we believe to be the particular social responsibilities which, in a given day and age, need to be demonstrated. For example in our communities in the United Kingdom the paramount issue in this respect is the care of the ageing population. This is the challenge to us all. We know that unless we find proper solutions to the care of our ageing population there will be back pressures on the whole medical system, as well as inadequate caring for our elderly people.

As Professor Woodruff said, the whole hospital system in Scotland deals with old people. To an increasing extent all our acute services are dealing with old people. But, in the teaching hospital, there is an aspect of this responsibility which is not properly discharged at present. This is not a question of attributing faults at all, but of noting the situation that a small percentage of these elderly patients in our acute wards become what is sometimes, rather unkindly, called 'bed blockers'; in other words, they reach a point at which the acute caring system can do no more for them, but there is no other place for them to go. They lie in bed, people are quite kind to them, of course, but, at the same time, there is a tendency for the medical student to see this as some kind of a nuisance problem. This can be a psychologically damaging demonstration. I believe that it is incumbent on us to find the way not only of dealing with the problem in the teaching hospital situation but also of dealing with it in a fashion which enables a teaching message of proper effect to come through.

There are other examples of this kind. We have developed, and are in the process of extending, our teaching systems to demonstrate primary care. I would think that all medical education systems need to have some demonstration of this kind, whatever the solution they adopt in relation to primary care—and, of course, there can be several solutions. But we are not telling the young enough about the real world in which they will live and practise unless they see something at close quarters of how it works.

What about the socially deprived groups who are distinguished by the fact that they do not operate on the normal health care assumptions which we expect of our communities, that if health care is needed by someone he comes to get it. They are distinguished by the fact that they have a disproportionate number of health problems and that they do not get them properly looked after. In terms of the needs, at any rate of Scotland, it is pressing that we learn how to

deal with these communities—and, again, we need some sort of demonstration.

I could go on with this for a long time, but all I am saying, in effect, is that if we accept that we have social responsibilities, or that we have to teach social responsibilities, in medical education, let us find ways of doing it by demonstration.

The same probably applies to the question of resource responsibility, commented on by Mr McIntosh. Whereas in the United Kingdom responsibility for the provision of all the necessities of care has been taken over by the State the doctor has been separated from any sort of cash nexus. In this kind of situation, is it possible to create in some other way a continuing sense of the responsibility of a doctor for his act, when he pulls out the health service cheque-book, as it were, and writes out a prescription or orders a regime of tratment which will call upon considerable resources?

It is clear that this is one of *the* main issues in our health service today: how can we, in an environment of clinical freedom for our doctors, nevertheless by their voluntary actions, create situations in which this immediate sense of identification with the resource aspect of their decisions is restored? I think it can be done, although it is very difficult. Once again, we can set up situations in which this becomes part of the working life of the medical unit. This, again, should be a demonstration in the process of education. As Dr Forwell said, of course it is linked also to questions of effectiveness. It is difficult, totally, to dissociate the two. If we work at effectiveness and we work at resources, we come at the same sort of issues from different sides.

Let me turn from our discussion on the responsibilities of medical education to the health care system and look at the responsibilities of the medical care system, or the medical care provider towards medical education.

I suppose the overriding question here is what kind of responsibility does the medical care provider have for the neophyte workers in his system? This is probably different in different countries, according to the way in which the separate responsibilities of medical care and medical education have been defined. But, in the United Kingdom at any rate, where there is a monopolist employer—or virtually so—in the shape of the National Health Service, it seems to me not in doubt that that employer has a major responsibility to devise career systems which are appropriate to the needs and aspira-

tions of the young people coming through its health profession education processes. How are we doing in this regard? I think we can point to a number of discrepancies.

Let me, first, touch on the question of incentives. When we do not get sufficient young people to hold up their hands and voluntarily become, say, geriatricians, is it the fault of the medical schools that they have not adequately indoctrinated the young? Again if they do not want to go to unpopular places, is that the fault of medical education? If they are not sufficiently interested in management and resource responsibilities, is that the sole responsibility of the process of medical education? I think not; we have to consider the way in which our incentives work. It is not normal for water to run uphill. In a number of these situations, we will find that our incentives are calculated to work against our proclaimed objectives. This involves methods of remuneration, and in our circumstances such mysterious things as merit awards, how they are distributed and so forth. But, if a young man knows that if he goes to a certain kind of place, or into a certain kind of specialty his chances of getting up the ladder, in terms of financial reward are substantially reduced, it is hardly surprising if he is rather reluctant to move in that direction. So let us make sure before we start blaming medical education for difficulties of this kind, that we have done all we can in terms of creating the right incentives.

In looking to improve this situation we need all the help we can get and in particular the help of prestigious and influential academic clinicians. But there is a certain ambivalence, in the clinical teacher's viewpoint because he is sometimes looking at it much as a specialist in a particular field as in terms of an educator with total responsibility for the young people under his command. He has to think out the needs of the larger responsibility.

Manpower producer and manpower consumer: the left hand and the right hand. There is a lot of evidence—there have been questions raised about it all through the meeting—of misfits in different situations. Again, it is hard to pass up on the responsibilities of the medical care provider which are at least as great as those of the medical educator.

Let us have some good news. First, it is possible to improve situations by creating the right kind of incentives. Lord Cohen pointed to the immediate benefits in the early days of the NHS produced by a career structure which enabled qualified consultants and

specialists to go out to every part of the country in many places where they had never been previously.

There are, of course, quite a lot of misfits too. We all know about the world 'brain drain', that, in any given time, an enormous number of doctors are in orbit, most, but not all, moving from the developing world, to the developed world. The responsibility for this is usually attributed to the receiving countries for luring them in. In fact, I think the opposite is true. The real problem lies in creating a situation, in which many doctors are being produced with aspirations which cannot be matched in terms of the career that they can be offered. When this happens a forced draft to export is created.

There are peculiarities about the United Kingdom career structure. Our system of hospital staffing is based quite reasonably on a more or less fixed ratio of training posts to career posts. But, in many parts of the hospital system, there are young people working in junior jobs which are not designated as part of the training complement and for whom there really is no possibility of reaching a career post in that field of work. Yet they are in an environment which is building up all the aspirations to take them in that direction. It is not too surprising if they cannot find a related career outlet in this country that they go elsewhere. What is happening, as we know, is that many of these posts are now recognized as having no real career outlets, so they are filled by doctors from overseas who are employed in a capacity which our own young people will not accept. This is nothing of which to be proud.

Surely, we need to think about the balance between our education process and our career structure; surely, we should have a career structure that allows a meaningful outlet with appropriate responsibility, for the products of our medical education.

What about general practice? We are doing fairly well in relation to general practice, as has been said. Yet, may I sound a little cautionary note about this. As we have heard, we are building up the specifications of training for general practice: for example, three years' vocational training. When this is done, not only are certain skills imparted but many aspirations too. I am not quite sure that the work opportunities and resources being designed for our young general practitioners when they come through will allow them to fulfil all their aspirations. Again, we must think about the fit and, if necessary, make some changes. Otherwise there is surely a possibility of disillusionment and loss of professional morale.

What about women students? We are now approaching 50 per cent admissions without the real beginnings of a career structure which is designed to make use of the girls who will get married—and they are all going to get married and have children. Are we just going to let them waste, or are we prepared to make the necessary changes?

Enough of this; the point is that in this fit between medical education and medical care, in terms of the manpower and womanpower produced, there is a responsibility lying with the medical care authority to devise a programme suited, adapted, adjusted, so that the medical education programme and the career programme go together.

Finally, let me come to two 'cricket' propositions, 'cricket' in the sense that the other suggestions I have made are attainable, however difficult; but I am not so sure about the ones I will now discuss. With regard to medical education in the United Kingdom, set free by the recent recommendations of the GMC, which Professor Walton told us about—the presiding mind there was Lord Cohen—we have had two decades of curriculum review and change. I should think that we have had a level of dedicated attention to the educational process unmatched in any other field—and the same is true in the United States.

In a sense, we are now looking at some of the consequences of this, because the GMC has just surveyed the scene. A report is in front of us derived from information supplied by our medical schools of the content, organization, and trends of basic medical education which we hope will be published soon, with the help of the Nuffield Provincial Hospitals Trust. One cannot help asking where do we go from here? Here is an impressive display of the zeal and attention which has been given to this important field, yet do we have any means of measuring the result of all this? Do we go on with more curriculum change and, if so, are we prepared to go on without some criteria of measurement of effect? Of course, this eventually takes us to what kind of doctors do we want and what are our objectives? We all remember our rousing debate about it, involving Professor Walton, Dr Bowers, Dr Donald, Professor McGirr, and many others. It was a splendid debate—without perhaps clarifying precisely where we go from here: I leave that as a question sticking to the wall.

The other aspect of the medical education process about which we

do not know enough—although I am glad to hear from Professor Henry Walton that beginnings are being made—is in the attitude-creation aspect. This is the undisclosed 50 per cent of the effect of medical education which is so important. We need to know more about what we do to our young people in that sense, in changing their aspirations, attitudes, values, and expectations, as they go through our hands.

I evoke the 'cricket' again for the health service. Many of the papers that we have heard at this meeting, have referred at some point to the inadequacy of the NHS as a means of dealing with community health. We have said, in writing if not so frequently in verbal discussion—although Dr Saward, for example, brought that out explicitly—that medical care is only a minor factor in the output of health in our communities. It has much less impact than life-style, in relation to drugs, tobacco, alcohol, or diet, pollution of the environment, accidents, and so on. What sort of model are we offering our young people to learn to think about this? We can only say that the whole NHS context, as it is defined in this country, is now narrowed down to a point at which it is virtually only a medical care system. Most of the responsibilities, or the possible effects which might change this kind of health creating or health destroying aspect of our environment, lie elsewhere.

Where do we go from here? I do not know, but possibly some of our questions raised about community involvement have relevance. To some extent, at any rate, we are dealing with matters about which only the individual, or the community itself, can make the necessary decisions to change. What else can be done and how can we create the right model without major political change? This is very difficult to know, but if there is some appropriate debate to get the necessary leverage for change we should be doing our best to set it going.

That is enough, quite enough, but let me say one more thing. That is, to thank our fairy godfathers, Macy and Nuffield, who have brought us all together in what, I think, was an inspired, generous tribute to the Edinburgh Medical School and to the whole of Scottish medicine.

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Postscript

A note on the proceedings of the meeting

GORDON McLACHLAN

Postscript

A note on the proceedings of the meeting

The meeting was more than a series of sessional exercises in nostalgia and piety in tracing the history of the influence of Edinburgh medicine, and its links overseas, particularly with the United States.

Edinburgh has long had a reputation for its medical scientific work, but part of its character is rooted in a philosophical and humanitarian ethos associated with the city and its culture. Thus, while the practice of medicine has always pursued the scientific path, practitioners have also been ready to apply medical scientific knowledge to the relief of suffering, and early in the history of medical teaching arrangements in the City of Edinburgh dispensaries had a special and caring reputation for the care they gave to the poor. It was there that the students had a grounding in the problems which were spread throughout the community at every social and economic level, and therefore were enabled to have a wider vision on medical care than would have been the case if the only patients they saw were those who came to hospitals. It was thus no accident of history that Edinburgh established the first Chair of General Practice in the United Kingdom.

The growth of scientific medicine has made great and continuous demands on the educational system everywhere especially in the pressures to apply specific discoveries, particularly through advances in knowledge in the biomedical sciences. This had more than one side to it. The point was especially made not only in the paper illustrating the growth of science in medicine but also in the ensuing discussion, that quite apart from laboratory science, many discoveries had been, and were still being made through personal observation at the bedside by doctors trained to be scientific in their approach, which contributed to improvements in medical care generally. While

laboratory science is important, there would, indeed always be a need to study the structural and functional determinants of diseases at the bedside as well as to develop a closer association between the basic scientists and epidemiologists, not just for clinical trials but as a further dimension in the scientific approach to study disease trends in populations. There is still some way to go, for it is still regrettably the case that the conditions are such that many bright young physicians feel the way to preferment and success academically is by way of clinical research, however trivial, in the traditional manner. Yet there is an urgent need for a full understanding on the part of clinicians of the social and political environment in which medicine is practised for this has an effect on the attitudes of physicians as well as on their patients. After all, the cure for most of the problems which arise from inadequate education, poverty, poor housing, traffic accidents, etc., or as a result of environmental (in the broadest sense) hazards, and which make up a large part of the medical burden, depends on social and political action. Equally, many of the problems which present themselves to physicians in patients are a result of personal behaviour. Such, at one time controversial propositions are increasingly being accepted by the aware public as well as by physicians, for whom they present considerable challenges to long-established concepts, particularly to those concerned with medical education.

There was, perhaps understandably, no need for much separate discussion on Edinburgh and its influence on general practice, since to a large extent primary care is recognized in both societies as a key specialty in its own right. The general practitioner does his best as a generalist, using the scientific knowledge acquired at the basic stage in his education to counsel or treat, either directly or by referring to specialists as necessary. The objective of teaching in departments of general practice should be to introduce the students to the general situation in which patients, unrehearsed, present undifferentiated problems to the general practitioners and stimulate the student to apply in a practical situation the theoretical knowledge and skills he has acquired. This has to be seen in relation to the over-all objective of providing the student with a basic education on which he can build in the vocational period subsequently. As well as taking part in undergraduate teaching in this way, the Department of General Practice in Edinburgh is also engaged in special educational arrangements for the vocational period in training for general practice.

The papers on medical education indicate the similarity of the trends in each country in medical education since the Second World War. The presentations and discussion were notable for their demonstration how inexorably medical education appears to be having to react to the problems of medical care in our time, not just as seen by doctors but by a wider public. It seems to be generally accepted that it should still be cardinal policy to continue to provide a three-stage structure, viz. a basic education, with subsequent arrangements at the graduate level for vocational specialist training, and afterwards for continuing education. There are, however, still important questions about the selection of students for entry to medical school, but it is doubtful if there are adequate means of selection available to ensure that the doctors who are eventually produced have the motivation which accords with the long-established professional ethos of medicine. Indeed, it is questionable whether in Britain the current arrangements for school examinations for entry into university are altogether suitable for securing the right candidates with the requisite motivation. The particular question of selection for medical school, and again at the pre-vocational training period, need to be further carefully explored. Nevertheless the view was expressed that on both sides of the Atlantic the current generation of students was of a high quality and the students showed the right sense of vocation; there was therefore cause for optimism for the future.

The question of medical education and its gearing to the requirements of medical care and medical practice, was only lightly touched upon in this session. The problem was taken up, albeit in a minor key, in the later session concerned with current dilemmas.

In the session on specialty training and distribution, it seemed from the discussion that both countries are moving in the same direction, but they are probably at different points of a time-scale. The two major problems which seem to be emerging are the pressures for better distribution and quality control. The problem of maldistribution in the United States is much greater than that in Britain where, apart from one or two specialties in which there seems to be difficulty in recruitment, the National Health Service had created a system in which there is now a more equitable distribution of skills on the basis of population needs than before it was instituted. Because of the pluralistic and freer system in the United States, the means of attraction of specialists to underserved areas was still

largely through economic and allied incentives: certain specialties are unpopular probably by reason of a lack of aesthetic satisfaction. Doubts were expressed whether there are sufficient people being attracted to the preventive sector but this may be due partly to the vagueness of its image and role and the uncertainty of direction and responsibilities.

On the other hand, quality control is being explored and developed in the United States, prompted by pressures from the legislative branch of Congress. The thrust is somewhat different in Scotland, where the subject is being cautiously approached voluntarily by way of the encouragement of co-operative exploratory ventures on the part of the Colleges and Faculties through the medium of studies for the better integration of medical care. In the United States, the administrative branch of government had actually now a defined stake in quality control through the requirements of legislation, which had set up organizations for peer standards review in respect of publicly financed programmes. The objective is in effect cost containment although the responsibility for review is exclusively professional. In Scotland the major administrative control of manpower which is the major element of cost is exercised through the restriction of establishments and resources generally.

The paper on the meaning and effect of competition between specialties for resources provoked a lively debate because of the topicality of the subject. The contrast between the present, and the account given of pre-NHS days when medical staffs of hospitals were closely associated with the financial viability of the institutions they served, did not stimulate nostalgic panegyrics about times long past, never to return and with little or no relevance to the present, but served to pinpoint the essential dilemma of the clinician today: the reconciliation of the practice of personal medicine and the requirements of public accountability. It specially underlined the current pressure on clinicians to take a closer interest in the determination of priorities; and the recent squeeze on finance for health services gave added point to this aspect. At the same time there seems to be an urgent need for a greater appreciation by the public of the necessity to match their expectations to resources which are available, as a result of public policies. The better education of the public and politicians, however, has probably to be preceded by the better education of the doctors about the realities of the context in which medicine is presently practised.

All over the world the public is increasingly involved, not just as individuals but as electors considering a mass of suggestions about the course of public policy. Thus current dilemmas of American and Scottish medicine are strikingly similar despite the differences in formal structure, being increasingly concerned with public policies and the influence of governments on medical care. There is a need for reconciliation between the responsibilities and accountabilities involved as a result of individuals with separately developed professional ethics related to patients, etc., working in publicly financed services.

This was indeed highlighted in nearly all the papers and was a recurring theme in the discussion. What was specially notable was the more recent emergence from the highly complex American scene of certain contemporary problems long matters for debate in the United Kingdom: the pressures from rising costs; the need for equity of access and service, to be seen to be spread reasonably equally throughout the country; the pressures from central government to ensure equity and consequently the development of controls on costs and manpower; the seeking through better organization for economies against an ever-rising bill for personal services. There was a striking parallel too in the clutching at the straw of preventive medicine, without the accompanying development in either country of concepts which are sufficiently pragmatic in scope and direction to lead to measures likely to ensure results. Again, while the philosophy of wider public participation is now almost universally essential, it raises special problems of administration in democracy on both sides of the Atlantic. Above all, the way in which it seems that governments are being forced *faute de mieux* to make the running about rationalizing the system seems a common phenomenon.

It is questionable whether those in the private and voluntary sectors are rising to the challenge of developing sensible, viable alternative policies based on sound philosophies. This lack was brought out forcibly in the final session. A sense of urgency was undoubtedly captured in the rhetoric although sadly no obvious solution emerged.

That there is a challenge is evident on both sides of the Atlantic to those concerned with medical education and medical care; and as Sir John Brotherston so effectively brought out, a sympathetic understanding and appreciation of the problems of each are essential components in a firm base for future public policies.