Towards European medicine: an historical perspective

The FitzPatrick Lecture 1988

SIR ABRAHAM GOLDBERG, MD, FRCP
Regius Professor of Practice of Medicine, University of Glasgow

On 2 March 1944 Winston Churchill addressed the Royal College of Physicians of London and said 'The longer you can look back, the further you can look forward' [1]. Certainly to gain perspective and prospective of European medicine it is necessary to look back on its history. What are the threads or historical facts that have been woven into the as yet unfinished tapestry of European medicine?

Graeco-Roman medicine

Greek rational or Hippocratic medicine, as distinct from temple medicine, forms the very basis or frame of our tapestry. It was through the organisation of the Roman Empire that some aspects of the Greek approach to medicine disseminated throughout Europe. Many doctors of the Roman Empire, both military and civilian, were Greek [2], and it was only in 46 BC that Julius Caesar granted to foreign physicians the full rights of Roman citizenship. Until then medicine was regarded as undignified, fit for slaves and foreigners. The first Roman hospital was said to have been established on the island of St Bartholomews in the River Tiber, and indeed the London 'Barts' established in 1123 was named after this first hospital. The early hospitals in Rome were havens for the sick poor or slaves to avoid the trouble of caring for them in the homes of their masters.

The Roman army established hospitals throughout Europe at strategic sites (Fig. 1). There were as many as 60 small wards in such hospitals, with each ward capable of holding 10 beds. This arrangement would allow for up to 10% of the legion being sick or wounded. The identification of these buildings as hospitals is based upon the discovery within some of them of large numbers of surgical and medical instruments including scalpels and spatulae, probes, clips, tweezers, spoons and mixing bowls [2]. A tombstone for a medicus ordinarius (a senior medical officer) has been found at Housesteads [3], and surgical instruments have been found at Corbridge [4]. The legionary or

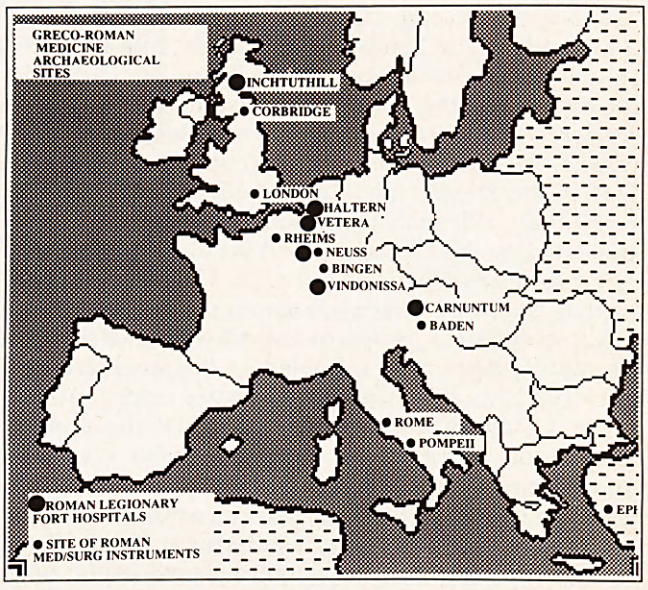

Fig. 1. *Graeco-Roman medicine: archaeological sites; Roman legionary fort hospitals; site of Roman medical/surgical instruments.*

auxiliary forts, seeded throughout Europe, were memorials to Roman public health and medical organisation. Besides proper drainage, adequate sanitation, flushing latrines and hot baths, great attention was paid to maintaining troops at the peak of physical fitness. They had to pass a medical examination upon entry to the service. It was the duty of the officers of the legion and the commander in chief himself to take care of the sick soldiers with suitable diet and attention by doctors. Periodic health checks were made and unfit soldiers were invalided out of the service. In contrast, it must be remembered that the homes of the urban poor even in Rome were filthy and infested because of inefficient sewage disposal [5].

The Romans also provided a state medical service of a sort. Vespasian (AD 69–71) provided teachers of medicine at the public's expense so that there would be a supply of doctors for the fighting services and for the poor. The Archiatri were public physicians who attended to the poor. How much of Graeco-Roman

Address for correspondence: 16 Birnam Crescent, Bearsden, Glasgow G61 2AU.

medicine was shared by the civil population in Europe is questionable. We might assume that in the tranquil period from Vespasian (AD 69–79) to the death of Marcus Aurelius (AD 180) our ancestors in Europe benefited materially and in health from the organisation of the conquerors. Certainly humble Germans and Britons attended the rich Roman invalids in the temples of health at Wiesbaden and Bath [6]. In addition to all this, the highly developed medical and surgical skills of the Roman world were recorded in a number of treatises, notably those of Celsus, Galen and Dioscorides, which form the basis of knowledge of medicine and its practice throughout the Middle Ages.

The Church in the Mediaeval period

After the fall of the Roman Empire, European medicine, or at least the caring of the sick, was predominantly in the hands of the Church. Although the Church discouraged science and scientific medicine, it did encourage the art of compassion, and hospices were created for the treatment of the sick throughout Europe. In Britain alone there were a thousand hospices in the Middle Ages. In mediaeval Scotland there were about 122 such institutions or hospitals, some supported by the Church, others secular [7]. The origin of hospices has been traced to Fabiola, a Roman matron, who used her own home in the 4th century to fulfil the christian 'works of mercy' [8]. Physicians in the Middle Ages were schooled in the seminaries of the Holy Church whilst surgeons were apprenticed under a Guild of Barber Surgeons [9]. Right into the 16th century in England the priest-physician constituted a dominant group in the medical profession [10]. Some ecclesiastical medical licences were granted by bishops and Archbishops of Canterbury. Many of the monasteries had their herbal gardens associated with the hospice, for example in Iona; in the absence of an adequate scientific basis of medicine, patron saints became an important part of the specialism of the time, for example, St Lawrence for the back, St Avertine for epilepsy, St Fiacre for the rectum.

Theodoric, King of the Ostrogoths in the 5th and 6th centuries, encouraged monks to care for the sick poor, a duty previously undertaken by the Roman Archiatri. The Church also founded great hospitals throughout Europe (Fig. 2). The world's oldest building still in continuous use as a hospital, since 1452 [11], is the Hotel Dieu in Beaune, Burgundy, France.

Arab medicine

The southern part of Europe was influenced by Arabian medicine. It was inherent in the teachings of Mohammed to encourage medical remedies. The works of Rhazes and Avicenna had a profound effect upon European medicine. Cordova in Spain became the apotheosis of Arabian medicine in the 10th and 11th centuries, with a library of 200,000 volumes and 50 hospitals. At that time there was also collaboration between Jewish physicians and Arabian physicians, and

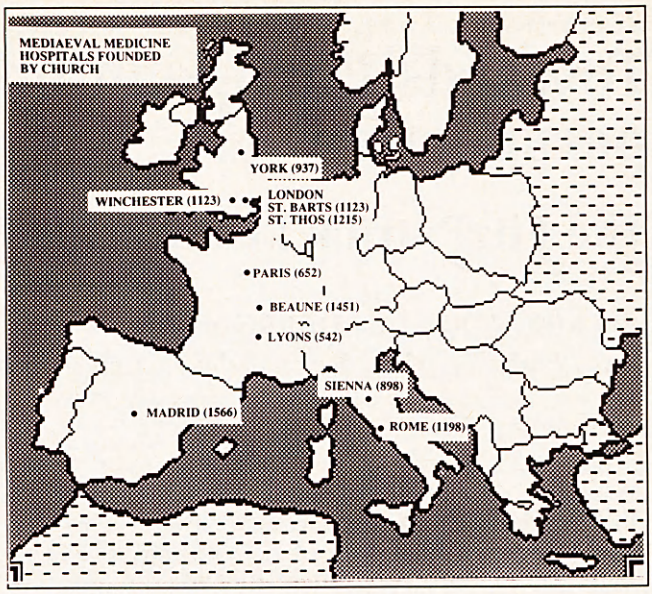

Fig. 2. *Mediaeval medicine: hospitals founded by the Church (date in bracket)*

Maimonides, born in Cordova, eventually became physician to the sultan Saladin in Cairo. In addition to his many other attributes, Maimonides made contributions to the study of asthma and psychoneurosis.

Medical schools

The organisation of medical schools is one of the important factors in European medicine. The school of Salerno was the first of these medical schools. It was started in the 9th century and flowered over the period of the Crusades from 1096 to 1270. It is said to have been founded by four masters, a Greek, an Arab, a Latin and a Jew. Not a trace is left of the actual structure of this school but there remain various published texts of books on medicine, anatomy, surgery and aspects of clinical examination. Students were not admitted until they were 21, and they had to study logic for 3 years before admission. A 5 year curriculum was followed by 1 year of practice with an older physician. The graduand was given a ring, a laurel wreath and a book, and was thereafter called 'magister' or 'doctor'; indeed it was at Salerno that medical men were first called doctors. Admission was not restricted by religion or nationality. From Salerno stems the custom of exams and degrees. Women played some part in the Salerno school; whether as doctors or nurses or midwives is not established. The school was eventually closed by Napoleon in 1811. Salerno thus represents in many respects the prototype of the modern medical school.

Montpellier in southern France started as a school of medicine in the 12th century and became renowned in the 13th and 14th centuries. Among a number of distinguished pupils was Petros Hispanus, a Portuguese who became physician to Pope Gregory X and later became pope himself, John XXI. In the 17th

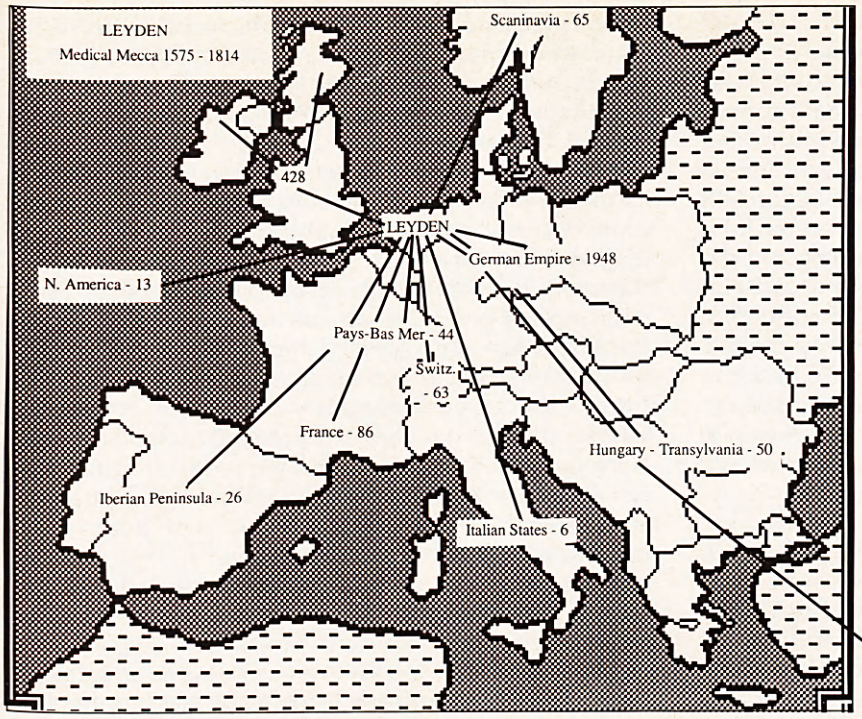

Fig. 3. *Leyden—medical Mecca: foreign medical graduands from Europe, Near East and North America 1575–1814. Original data from Ref. 12.*

century, Thomas Sydenham, after graduating at Oxford, studied at Montpellier.

The school of Bologna was founded in 1088. It was attended by Dante. He went to the lectures by Taddeo Alderotti who introduced consilia or discussion of clinical cases supplied to practitioners by 'consultants'. Paris became an important mediaeval centre for medical teaching, attended by Roger Bacon, a student of Oxford, who taught in Paris; later Padua became a famous centre renowned for the anatomical pioneering work of Vesalius and Fabricius to whom Harvey came as a pupil. By the time of the Reformation the popularity of the Italian and French medical schools had lessened because of the exclusion of all non-Catholics. Padua was particularly favoured in England because Protestant students were allowed to study there and take degrees, although it was nominally Catholic. The University of Leyden was founded in 1575. William of Orange wished to reward the citizens of Leyden for their successful fight against the Spaniards in the previous year and he asked them to choose between a 10 year remission of taxes and the establishment of a university open to Catholics and non-Catholics. They chose to establish a university which became one of the university centres of learning of medicine and law over the next centuries; it was a school of seminal importance because to it came students from various parts of Europe, particularly attracted by Boerhaave (Fig. 3) [12]. This directly led to the further development of the medical schools in Edinburgh and Vienna. The first medical student to graduate at Leyden was an Englishman, John James, who afterwards became a distinguished London physician. Throughout all the mediaeval and Renaissance periods and right up into the 18th and 19th centuries, scholars of medicine visited these schools of learning attracted by the fame, prestige and charisma of the great teachers. They ignored the barriers and boundaries of nationality in their quest for knowledge. This movement was facilitated by Latin as the language of medical communication. Boerhaave lectured *ex tempore* in elegant Latin. William Cullen, about 1750, was the first to lecture in the vernacular rather than Latin, although Paracelsus, 200 years previously was said to have preferred lecturing in German.

Great Europeans and their travels

Many of the great men of European medicine subjected themselves to the rigours of primitive forms of transport throughout Europe. Thomas Linacre, after graduating in Oxford, travelled to Bologna and Florence and Rome, returning as court physician to Henry VIII after 13 years in Italy, and in 1518 obtained letters patent from Henry VIII for the Royal College of Physicians. In 1589, out of 28 Fellows of this college, 7 of the 11 most junior had obtained their MD abroad—3 in Basel, 3 in Leyden and 1 in Heidelberg. Indeed, at one point, the College undertook measures to deter students from studying abroad, although Linacre and Caius believed that only benefits could emerge from such an interchange [10]. John Caius travelled to Padua and lodged in the same house as the great Vesalius. William Harvey studied in Padua with Fabricius, the successor of Vesalius. In Fabricius, deeply immersed in the anatomy of the vascular system, Harvey found a man to make his life-model [13]. Ambroise Paré served on the battlefields of Europe

under four kings of France. Paracelsus, who burned the books of Galen and ushered medicine into the modern age, was born near Zürich but travelled far throughout Europe, Turkey and possibly even Russia.

The influence of the Frenchman Laennec through his invention of the stethoscope became widespread through Europe. Laennec's work on auscultation was translated in English by the Scottish physician Sir John Forbes. In the latter part of the 19th century and the beginning of the 20th century there was a constant stream of young men from Britain to the continent, especially Vienna and Strassburg and Paris, to the laboratories of Aschoff in Freiburg, to those of Ehrlich in Frankfurt and many others. The great Virchov dedicated his early work to Goodsir of Edinburgh. All these travels and personal exertions were helping to sew together the fabric of European medicine.

Shared experiences of Europe

Medicine forms such an important part of the social history of Europe that it is no wonder that the shared experiences of Europe form an important part of the development of European medicine.

Wars and conquests

Winston Churchill in his lecture to the Royal College of Physicians in the 4th year of World War II [1] declared that 'human inventiveness has been fanned by the fierce winds of war'. Paradoxically, war provoked the human genius for survival. The surgical work of Ambroise Paré on the battlefields of Europe in the 16th century provided a remarkable contribution to the techniques of surgery. Many of the surgeons of Britain in the Napoleonic wars blunted their scalpels on the battlefields of Europe. With news of Waterloo, Sir Charles Bell travelled rapidly to Brussels, where he operated each day on the wounded for one week 'until his clothes were stiff with blood'. War gave an impetus to the development of orthopaedic surgery, of antibiotics, and the understanding of the stress syndrome; the squalor of Scutari was sublimated by Florence Nightingale to civil and military hospital and nursing organisation throughout Europe, as well as to the basic tenets of nursing care.

The dark pages of European history, stained by political, racial and religious persecution, affected European medicine. The Huguenot persecution brought good men to this country such as Peter Chamberlen, pioneer in obstetrics; the pogroms of Csarist Russia at the turn of the century, of the Nazis 30 years later, just as more recently the racial inequalities of South Africa, have caused the dispersal of men of considerable talent and even scientific genius. These traumatic upheavals provoked by intolerance played an important part in the scientific internationalism which exists today. Such men and women brought with them a knowledge of languages, science, medicine and arts to their host countries. At the time of the Reformation the unity of the humanistic world of the Catholic Church was split, and this was followed by the schismatic development of the nationalist states, factors which rendered these considerations even more important. All this was a triumph for humanity over man's inhumanity.

While we consider the dark side of human nature let us not forget these occasions when the prophets in some corners of Europe were scorned or ill-used in their own country but received acceptance and sometimes refuge elsewhere. For example, Marshall Hall, discoverer of reflex action, was humiliated and stigmatised, and his work rejected for publication although on the continent it was accepted and highly praised. Lister's theory on antisepsis was accepted with acclamation throughout Europe, particularly in Denmark, Germany and France, long before it was acceptable in London. Semmelweis advanced his theory on puerperal sepsis which he had proved by practical study, impressive in its statistical significance. He was scorned and drummed out of Vienna and had to seek a tragic sanctuary in Budapest. The same story is true in other fields of scientific endeavour. Mendeleev, the genius of the periodic table, was known everywhere for his work except in his native Russia. The family of Europe is fortunately big enough to compensate for transient aberrations.

Philosophers and philosopher-scientists

'Proud men of action ... are nothing but the unconscious instruments of the men of thought' (Heine).

Aristotle stated that a philosopher ought to begin life as a physician and a physician should end his life as a philosopher. He made no sharp distinction between science and philosophy, which indeed did not become separated until the 18th century. Certainly philosophers and philosopher-scientists have influenced the development of European medicine. Hippocrates was indebted to Pythagoras (580–448 BC) for the doctrine of numbers which probably suggested to him the four humours, and to Alcmaeon, Pythagoras' pupil, who stated that the brain and not the heart was the organ of intellect and the senses. It was through them and Socrates, whose life was partly contemporaneous with Hippocrates, that the questioning rational basis for scientific medicine was created. Aristotle himself laid the foundations of comparative anatomy and embryology. Galen and Paracelsus were originators of new concepts in medicine—plant medication in the case of Galen and the use of chemicals to cure disease (iatrochemistry) in the case of Paracelsus. 'The body consists of chemicals; use chemicals to cure disease!' Descartes (1596–1650) viewed the body as a machine, the structure and function of which was based on mechanistic principles. His philosophy and that of Bacon were the predominant influences of the new scientific revolution. Francis Bacon (1561–1626) was an eloquent spokesman for the experimental method. He introduced the inductivist philosophy of inferring causation from empirical observations. Sydenham (1624–1689) had as his closest friend the physician

and philosopher John Locke (1632–1704) who laid the foundations of modern empirical philosophy; indeed Sydenham treated Locke for his asthma. Locke was qualified as a medical practitioner and discouraged the blind following of convention or authority: 'Look at the facts and think for yourself'. Locke influenced Voltaire and also the founding fathers of the American revolution, but Sydenham must also have been affected by his genius, because he likewise discouraged speculation and led the physician back to clinical observation of the patient at the bedside.

Philosophers of the enlightenment of the 18th century both in Europe and the United Kingdom played an important part in the development of the ideas of the physicians of their time. William Cullen, only second in importance to Boerhaave as an 18th century medical teacher, was in close social contact with the great Scottish and European philosopher David Hume; he treated Hume in his terminal illness. Hume refuted Bacon's inductivist theory of causation based on empirical observation; it is only in our own century that Popper has resolved this controversy by his use of a hypothesis merely as a cockshy to challenge its falsity, our contemporary approach in medical research. Hume's friend was the philosopher Jean-Jacques Rousseau who played an important part in the origin of the French revolution, but it was in the atmosphere of revolution, partly created by him, that Pinel unchained the insane in Paris just a few years after the storming of the Bastille. The political and social scientists of 19th century Europe also had their effects on the development of psychiatry and social medicine. Jeremy Bentham, the utilitarian philosopher, the father of modern preventive medicine and public health legislation, had an influence throughout Europe.

Disease

The great epidemics of the last millenium were shared by Europeans because they travelled more widely and because disease does not obey frontiers. For example, the plague of the 14th century, the Black Death, spread through Italy and France to England and Germany and eventually Russia, returning again in less violent form at intervals to the end of the 17th century. It caused the death of about a quarter of the population of Europe, and half the people of London. A disease diagnosed as 'leprosy' was prevalent on the continent of Europe and in Britain by the 13th century, declining over the next 400 years. Local segregation in leper hospitals—several thousand in Europe—became the established form of treatment. Syphilis was another disease of European dimensions which became severely manifest at the siege of Naples in 1495. The Spanish occupants of Naples had the disease and they passed it on to the French invaders of Naples. The French called it Neapolitan disease; the Spanish named it the French disease but it undoubtedly became a European disease. Similarly the great epidemics of influenza and now the oncoming onslaught of AIDS emphasise that disease has no frontiers and must be fought on a global basis.

There is also in Europe a common pattern of disease prevalence, with of course some regional variation, as distinct from that occurring in Asia or Africa.

European scientific societies

The longer term effects of the Renaissance and in particular the writings of Francis Bacon in his 'New Atlantis' [14], influenced the development of scientific and medical societies throughout Europe. The Royal College of Physicians of London received its charter from Henry VIII in 1518. The Glasgow College of Physicians and Surgeons was founded in 1599 under the patronage of James VI of Scotland. The Accademia dei Lincei of Rome, so-called 'lynx-eyed scientists', was founded in 1603, of which Galileo was a member. The Royal Society of London, started in 1645, obtained a royal charter under Charles II in 1663. The Collegium Naturae Curiosorum was founded in Halle, Germany, in 1652. The Academie de Science was founded in Paris in 1666, supported by Louis XIV and Colbert. These scientific societies, which were to be of great importance to medicine, were a European phenomenon not just a British one, and they represented a way of transcending national boundaries through the communication of science and medicine. Thus the Royal Society of London has a foreign secretary, and Leeuwenhoek, although a Dutchman, was made a Fellow of the Royal Society of London in 1680 for his brilliant work on microscopy, based on his letters to the Royal Society.

Dissemination of medical ideas

The dissemination of news throughout Europe began in Rome. The Acta Diurna or daily events was posted in public in Rome and copies were made for dispatch throughout Europe to distant parts of the Empire, even for perusal in private houses, like the morning newspapers [15]. At the end of the 13th century Alderotti, who founded the school of Bologna, recorded clinical cases, afterwards collecting them in the form of a medical correspondence or Epistolae Medicinales. A communication technique that existed from antiquity was the courier system. The Dutch scholar Erasmus had his own system of communications in which he would send out a number of his young protégés at certain times of the year to carry his letters to various parts of Europe. The primary method available to scholars for distributing their ideas before the appearance of printed books or periodicals was indeed by personal correspondence written in Latin.

With the invention of printing by Johan Gutenberg in about 1438, book production gradually increased over the next 200 years. Harvey's *De Motu Cordis* appeared as a book of 72 pages published in Frankfurt in 1628, probably the most important medical book ever written. The first scientific periodicals or journals were the *Journal de Scavans* which began in 1665 [16]

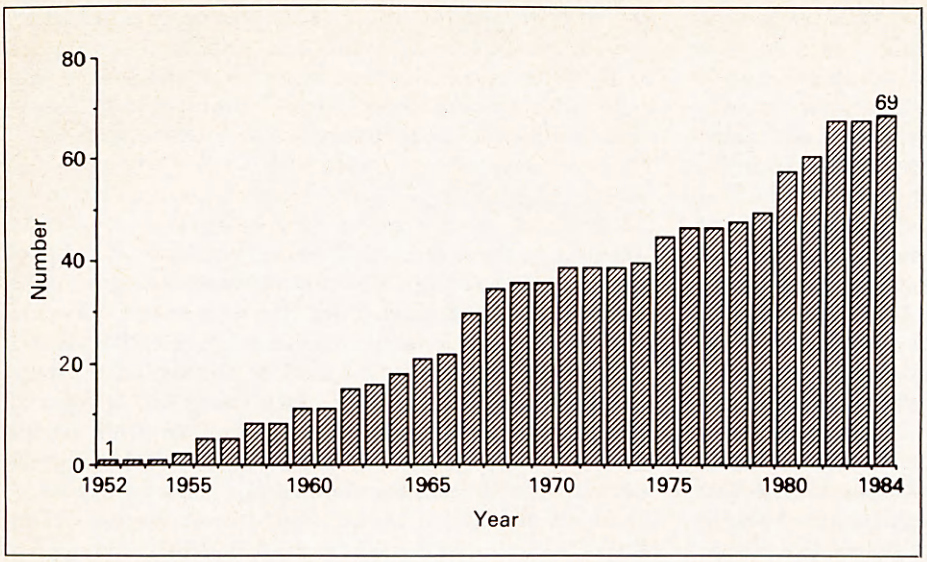

Fig. 4. *Medical periodicals with word 'European' in title from 1952 to 1984. For sources of data see text.*

and the philosophical transactions of the Royal Society of London which were inaugurated in 1664. The first wholly medical periodical appeared in France in 1679 and ran for 2–3 years (Le nouvelle des couvertes sur toutes les parties de la medecine). Thereafter a whole series of medical journals were published throughout Europe. These journals undoubtedly stimulated the flow of ideas, despite the fact that they were mainly written in the languages of their country of origin. It is of interest to trace journals relating to medicine specifically bearing Europe in their titles. The index catalogue of the Surgeon General's office, US Army, 1892 (which became the National Library of Medicine in the 1960s), had no journals specifically European. A study of the *Index Medicus* (1960) and the index of the National Library of Medicine of the NIH in Bethesda (5th edition, 1984) reveals the growth of medical periodicals with the word European in their title from 1 in 1952 to 69 in 1984 (Fig. 4).

Concepts and classifications of disease—a European achievement

The old humoral concepts of disease or 'distempers' derive from the time of Hippocrates and persisted to the beginning of the 17th century although, by then, conspicuous clinical conditions such as syphilis, smallpox and the plague were defined as separate conditions. Plato had originally suggested that different patterns of symptoms corresponded to specific diseases, a concept advocated again in the 16th century by Paracelsus, who considered the humoral theory had outworn its usefulness. This view was supported later by the disciple of Paracelsus, the Flemish physician Van Helmont, as well as the 17th century English physician Sydenham who was also one of the first to combine case histories of individual patients with a particular disorder into portraits of disease. Thus he painted a brilliant composite picture of the disease 'gout' from which he himself suffered. The Frenchman de Sauvage in the 18th century extrapolated this into a vast classification of diseases, 2,400 of them, many of them symptoms. William Cullen greatly simplified this classification. None of these approaches to classification and concepts involved the consideration of the anatomy and pathology of disease. Indeed Sydenham turned his face against the use of post-mortems in the elucidation of disease, although the Frenchman Jean Fernel, in his treatise *Medicina* of 1554, had stressed the importance of association of clinical symptoms with changes in the solid parts of the body shown at post-mortem. Two centuries later in 1761, Morgagni in Italy wrote 'Diseases leave a tell-tale footprint in the tissue of the body', and noted that it was important to verify clinical judgements by post-mortem. Thirty years later the Scotsman Matthew Baillie substantiated and refined the work of Morgagni in his book on 'the morbid anatomy of some of the most important parts of the human body'. This concept of combining pathological and clinical findings was advanced by Laennec in France who attempted to correlate post-mortem findings in the chest with his findings obtained by the stethoscope. By the middle of the 19th century a concept of disease had been achieved which was sufficient to accommodate the impending massive advances in diagnostic technology. In all of these approaches it is clear that no single nation was involved, but the achievement was a European one.

Technical advances—a European achievement

Over the past few centuries medicine has been particularly influenced by the progress of technology. European teamwork can be illustrated by two simple examples, the sphygmomanometer and the thermometer.

Sphygmomanometer

The first attempt to measure blood pressure was made by the Reverend Stephen Hales who in 1733 inserted a

9 foot long glass tube into the carotid artery of a mare, noting the height to which the blood rose. In 1828 the Frenchman Poiseuille modified this approach by inserting a U-shaped tube partially filled with mercury, and in Germany Carl Ludwig added the sophistication of a float to the mercury level attached to a pen to record the pressure. This work in animals was applied to man by Herisson in France who used a mercury-filled funnel closed with a thin membrane and attached to a capillary tube. The pressure required to obliterate the radial pulse was read on the capillary tube. Further modifications were made by the Frenchman Marey and later by Mahomed of Guy's Hospital. In 1876 a German, Samuel von Basch, introduced a machine called the sphygmomanometer, which was further modified by Potain in France. In 1896, the Italian physician Riva-Rocci developed the sphygmomanometer as we know it today. In 1905 the Russian physician Korotkoff used the stethoscope with Riva-Rocci's machine to hear sounds at the cubital fossa which he interpreted correctly as systolic and diastolic blood pressure [17–19].

Thermometer

Galileo has the credit for inventing this instrument, in 1593. He took a glass vessel about the size of a hen's egg fitted to a tube, the lower end of which was immersed in water; the variations in the temperature of the vessel caused variations in the level of the water in the tube. Later, in the 17th century, Sanctorius experimented with thermometers to estimate the temperature of the human body. The Dutch instrument-maker Gabriel Fahrenheit used mercury as the registering fluid and designed a temperature scale. Boerhaave persuaded Fahrenheit to construct a special thermometer to measure fevers in patients. This was exploited by Boerhaave's pupils, van Swieten and De Haen in Vienna, as well as by the Scot James Currie who practised in Liverpool, attempting to treat typhoid fever with cold baths and checking his results by thermometry. The German physician Carl Wunderlich made careful observations of thermometry on 25,000 patients; he 'found fever a disease and left it a symptom'. Aitkin in 1852 developed the narrow glass tubing to prevent the column of mercury falling back, and Thomas Clifford Allbut in 1870 achieved the size and shape of the portable thermometer which is in contemporary use [18].

Development of specialties

The development of the many medical specialties, including pharmacology, through the 19th and 20th centuries has been an example of European collaboration. The University of Tartu in the Baltic provinces of the Soviet Union invited the German Rudolph Buchheim to the chair of materia medica in 1846. Buchheim was a pioneer in scientific pharmacology and set up a small laboratory in his own home devoted to chemical analysis and animal experiments, later creating a pharmacological institute, the first of its kind in the world. Buchheim's pupil and successor Schmiedeberg later moved to Strassburg in 1872 to the Institute of Pharmacology which under him became an international centre. Among others who came to Strassburg was Arthur Cushny, who later occupied the chair of pharmacology in Edinburgh (1918), and John J. Abel, the father of American pharmacology [20–22].

With the growth of each new specialty and sub-specialty, experts seek the fellowship and stimulation of their colleagues in whatever country of Europe or indeed of the world, a propensity which is facilitated by modern forms of transport and travel grants from government and industry. A British cardiologist or hepatologist or an endocrinologist is more likely to know of the related research of a colleague in Munich than that of his neighbour working in a different field in his own city. This process of Europeanisation of medicine in its widest aspects has proceeded naturally, nourished by the instincts of scholarship and human compassion. With the advent of the European Community it has taken on a legal and political dimension.

The European Community

The concept of European unity was ignited into reality by the Roman conquest. Although rewarded by relative peace in the second century AD, its cohesion was affected by central and peripheral upheavals. At the time of the Reformation, Erasmus of Rotterdam (1467–1536) embodied the ideal of a purified, enlightened Europe bound in peace and fellowship [6]. After the Reformation and the rise of nationalist states, centuries of war scarred the face of the Continent. From St Helena, Napoleon mused on the peaceful united Europe that might have been, and later Hitler aimed to enforce a perverse and evil form of unity.

It took two great wars, initiated in Europe, some would name them European civil wars, to advance the concept of true European unity.

The European Community was established in 1957 by the Treaty of Rome, with the common aim of ever-closer union of the peoples of Europe, and the ultimate aim to achieve a fully integrated internal market, the so-called Common Market. The original members were Belgium, Germany, France, Italy, Luxembourg and the Netherlands; the UK joined in 1973 and there are now 12 members. In addition there is the European Free Trade Association (EFTA) which includes Austria, Finland, Norway, Sweden and Switzerland, and there is also a Council of Mutual Economic Assistance (CMEA) including the USSR, Bulgaria, Czechoslovakia, the German Democratic Republic, Hungary, Poland and Romania. Yugoslavia is affiliated to this organisation.

The European Community is primarily an economic organisation. Yet the vision of the founders was for an ultimate political unity based on a common philosophy, and foremost in this philosophy is the common approach to medical care. In 1985 the Commission published its White Paper on the completion of the

Internal Market, a document of great importance which set out proposals designed to weld together the separate economies of the member states into a single great market of 328 million people by 1992. The White Paper covers the whole field dealing with physical, technical and fiscal problems; it contains no less than 300 proposals. Of particular interest are the proposals relating to drug regulation, medical training and the mutual recognition of diplomas and professional qualifications, as well as medical and health research co-ordination.

Drug regulation

Although there was no specific legislation or regulation for drugs in the original Treaty of Rome, the EEC in 1976 introduced a specific additional controlling body, the Committee for Proprietary Medicinal Products (CPMP), to provide a forum for considering marketing authorisation on a community-wide basis, but its opinions are not binding. The CPMP is composed of representatives of all the member states in the EEC Commission and it discusses problems of common interest, particularly the exchange of information relating to adverse drug reactions. Its involvement in marketing authorisations is invoked when a company has obtained an authorisation in one member state and wishes to obtain the same in two or more states. After submission to the CPMP and the member states concerned, the various states have 120 days in which to raise any objections. If objections are raised, the CPMP must meet within 60 days to discuss the application and give its opinion which is then transmitted to the member states concerned. Each state then has 30 days to determine what action to take. So far, the system has not been a great success. The national licensing authorities seem unable to agree on licensing decisions, although in principle they are based on the same evidence. There are undoubtedly fundamental differences and approaches to drug treatment in each of the member states. Since 1975 this multi-state procedure has generated 41 applications from various countries of origin in the European Community; 16 of them have been rejected. In 12 years no licence granted in one country has been unequivocally recognised in another [23].

The Community also established, in 1987, a new directive whereby the CPMP will consider applications for new products of biotechnology, the so-called High Technology Directive, prior to their evaluation and grant of a marketing authorisation by the member states. This would seem to be a first step towards the centralised European regulatory authority. The committee's opinion, under the High Technology Directive, is not binding on member states, but changes could be introduced to make these 'opinions' into 'binding decisions'.

Completion of the internal market by 1992 is extremely ambitious for medicines. Some form of supranational drug regulatory system is bound to be established, with a corresponding loss of sovereignty by all the national authorities. At present it would seem premature that such a supranational organisation should take licensing decisions on behalf of the community for all drug regulatory decisions. After all, 80% of the DHSS Medicines Inspectorate's work at present is concerned with the maintenance of existing drug licences and the enforcement of good manufacturing practice. It would thus seem likely that the central agency, acting on behalf of the community, would deal with major new applications while the applications for variants of well established medicines could be handled through the national regulatory authorities and under a system of mutual recognition. In addition, the central agency would have to be serviced by consultative expert committees which have served so well, for example in the UK Medicines Division; indeed the larger European pool of experts could donate more specialised committees appropriate to the growing spectrum of drug usage. It would be essential also for the central agency, with a much strengthened administration, to co-ordinate matters of advertising, labelling, inspection, pre-licensing and post-licensing surveillance. It is doubtful whether this harmonisation can be achieved by 1992, but an effective European drug regulatory system is probably inevitable.

Medical training and recognition

In 1975 the Commission set up the Advisory Committee on Medical Training, including training of nurses, midwives, doctors, dentists, veterinary surgeons as well as senior officials on public health. Legal commitments have been introduced on the standards of professional diplomas in different member countries, and a consultative committee has been appointed to co-ordinate future work on training. The adoption of the directives in 1975 was a major step forward for the right of free movement of the medical profession. The Community has set up a system of automatic recognition of doctors' diplomas between member states based on a common standard of training. Each year there are further advances towards this aim.

In the various member states there is now a common legal framework for some 600,000 doctors and for qualifications of about 45 different specialties [24]. In Fig. 5 can be seen the number of doctors in the 12 European Community countries who have obtained sanction for the movement either out of or into each country in the decade 1976–86. These figures have been obtained by courtesy of the UK Department of Health, 1988. Such registration is not always followed by actual movement, and the duration of stay in the UK does not exceed 1 year. By ensuring freedom of movement for health professionals through mutual recognition of diplomas, based upon agreed training criteria, the Commission makes a contribution to the raising of standards in many of the member states of the Community. The Advisory Committee on Medical Training has a very broad view of its subject. As part of its remit many relevant questions have been consid-

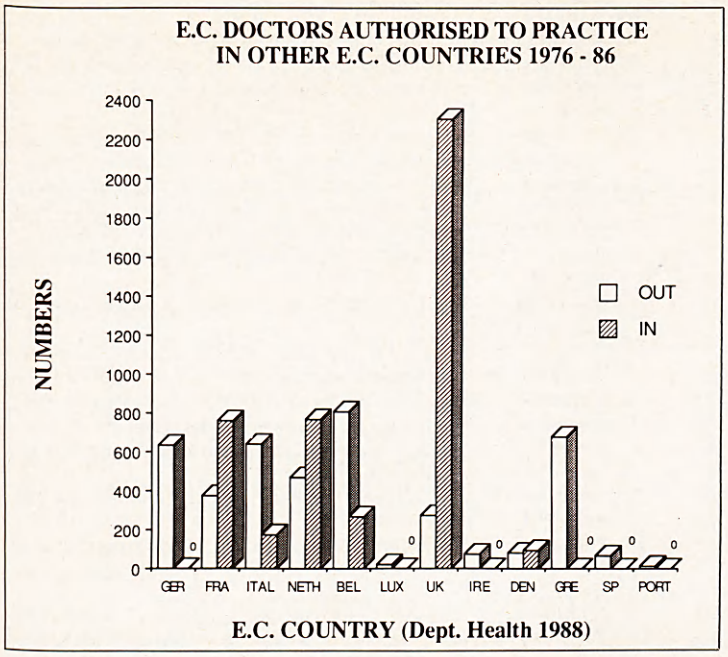

Fig. 5. *European Community (EC) doctors authorised to practise in other EC countries 1976–86. Data by courtesy of UK Department of Health, 1988.*

ered, eg ratios of doctors and medical students to populations, undergraduate and postgraduate and general practitioner training into the 21st century. Discussions are still proceeding on the best common denominator for harmonisation of all these matters by 1992.

Medical and health research co-ordination

By December 1985 there was a considerable degree of medical and health research co-ordination among the countries of Europe (Table 1). About 1,460 teams were participating in this collaborative research on subjects such as AIDS, age-related health problems, environment and life-style and medical technology development, and on health services research. The Research and Development Co-ordination Programme for 1989 is on target with these topics [25].

Competitive spirit of Europe

The spirit of healthy competition now affects many aspects of life in Europe, for example the European soccer football and the European song competitions. The competitive, or at least comparative, spirit has entered the field of European medicine. The comparative spirit is not entirely new. In 1584 the need arose to replace Peter Turner as physician to St Bartholomew's Hospital, London. The Royal College of Physicians strongly urged the appointment of Henry Wotton, claiming that 'in all other honourable cities and towns *in all Europe*, where the like hospitals are maintained, the physician is always provided out of the body of the Society and College of the Physicians of the same city' [10]. Many more recent examples of this comparative spirit exist, illustrated by an example from the Congress of the European Dialysis and Transplant Association of 1987 [26] held in Berlin. The proportion of patients accepted for renal replacement therapy in 1985 who had glomerular nephritis, confirmed by histological examination, varied between 6% in Bulgaria and 83% in Finland. This is an example of comparative diagnostic accuracy associated with a very important surgical manoeuvre. The comparative approach has also been used by Sir Douglas Black in 1988, comparing countries with a comparable level of affluence, to show the percentage of the gross domestic product devoted to health care (Table 2) [27]. Of these equally affluent countries, Britain comes at the bottom with 5.7% and France at the top with 9.4%. Of course, there may well be many reasons for these differences, but healthy competition among members of the same family must in the end be beneficial.

It must also be appreciated that the European Community is not the whole of Europe—there are also Austria, Finland, Norway, Sweden, Switzerland of EFTA, and the USSR and its associated countries (the countries of the Council of Mutual Economic Assistance). All these countries are also involved with the European Community countries in matters of medicine, for medicine transcends all their boundaries. European

Table 1. Commission of European Communities medical/health research co-ordination (December 1985) [25].

Projects	No. of teams
AIDS	94
Age-related	219
Environmental/life-style	214
Medical technology development	736
Health services research	197
	1,460

Table 2. Proportion of GDP devoted to health care [27].

Country	% of GDP
France	9.4
Netherlands	8.3
Austria	7.9
Italy	7.4
Belgium	7.3
Finland	7.3
Britain	5.7

medical specialty organisations and congresses are attended by members from all over Europe, including Russia and her associated countries. The influence of glasnost and perestroika on European medicine may be considerable over the next few decades. Nor have we considered the influence both now and in the future of world medicine, especially that in the USA, although I can fully justify this omission by the thesis put forward that it was European man who bestowed the gifts of modern medicine and science on the world at the beginning of the 20th century.

What do these developments in European medicine mean to the individual doctor and research worker? I would like to leave you with one final impression that I received earlier this year when reading an MD thesis on the subject of the treatment of leukaemia. This young man was thanking colleagues from 17 different cities of Europe, who permitted him to make observation on their patients, and he gave particular thanks to the European Group for Bone Marrow Transplantation, who kindly supplied raw data for his analyses. He is the direct descendant of the wandering scholar of the mediaeval, renaissance and post-renaissance periods, whose journey we have traced in the past hour.

Acknowledgements

Dr A. Doig, Edinburgh. Dr J. S. Logan, Belfast. Dr Gordon Anderson, Glasgow University Library. Dr D. Paul Mason, SMO, Medical Manpower and Education Division, Department of Health. Mr David W. C. Stewart, Librarian, The Royal Society of Medicine, London. Ms Georgina Plowright, Curator, Corbridge Chesters & Housesteads Roman Museums. Dr P. Semple, Dr J. Brown, Dr J. Logan, Dr R. S. C. Rodger, Glasgow. Dr Lawrence Keppie, Curator in Classical Archeology and History, Hunterian Museum, University of Glasgow. Dr Derek Dow, Archivist, Greater Glasgow Health Board. Mr Michael Moss, Archivist, University of Glasgow. The late Dr Douglas Guthrie, who encouraged my interest in the history of medicine 43 years ago and whose book *A history of medicine* provided a rich source of material. All my colleagues in the department of medicine who have contributed much in discussion of this subject.

References

1. Moran, Lord and Churchill, W. S. (1944) *Lancet*, 11 March.
2. Johnson, Anne (1983) *Roman forts of the 1st and 2nd centuries AD in Britain and the German provinces.* London: Adam and Charles Black.
3. Collingwood, R. G. and Wright, R. P. (1965) *The Roman inscriptions of Britain. I. Inscriptions on stone.* Oxford: Clarendon Press.
4. Gilson, A. G. (1981) A group of Roman surgical and medical instruments from Corbridge. *Sonder druck ans dem Saalburg: Jahrbuch XXXVII.* Berlin, New York: Verlag Walter de Gruyter.
5. Boon, G. C. (1983) Potters, oculists and eye-troubles. *Britannia*, **14**, 1–12.
6. Fisher, H. A. L. (1935/1986) *A history of Europe.* Glasgow: Fontana, Collins.
7. Durkan, J. (1962) Care of the poor: pre-Reformation hospitals. In *Essays on the Scottish Reformation 1513–1625* (ed. D. McRoberts) Glasgow: Burns.
8. Saunders, C. (1988) The evolution of the hospices. In *The history of the management of pain* (ed. R. D. Mann). Carnforth, England: Parthenon Publishing Group.
9. Illingworth, C. F. W. (1963) The Ernest Finch memorial lecture. Sheffield University.
10. Pelling, M. and Webster, C. (1979) In *Health, medicine and mortality in the sixteenth century* (ed. C. Webster). Cambridge University Press.
11. Bender. G. A. (1966) *Great moments in medicine: a history of medicine in pictures.* Parke-Davis & Company, Detroit: Northwood Institute Press.
12. Frijhoff, W. (1981) *La Société Néerlandaise et ses gradués 1575–1814*, p 380. Amsterdam: Maarsen.
13. Osler, W. (1906) Harveian oration. Royal College of Physicians, London.
14. Kronick, D. A. (1962) *A history of scientific and technical periodicals: the origins and development of the scientific and technological press 1665–1790.* New York: Scarecrow Press.
15. Monro, T. K. (1928) Some notes on medical journalism. *Glasgow Medical Journal*, **109**, 133–7.
16. McKie, D. (1948) The scientific periodical from 1665 to 1798. *Philosophical Magazine*, 122–32.
17. Lewis, W. H. (1941) The evolution of clinical sphygmomanometry. *Bulletin of the New York Academy of Medicine*, **17**, 871–81.
18. Lyons, A. S. and Petrucelli, R. J. (1978) *Medicine—an illustrated history.* New York: Harry N. Abrams Inc.
19. Pickering, G. W. (1955) *High blood pressure.* London: J. & A. Churchill.
20. Weinshilboum, R. M. (1987) The therapeutic revolution. *Clinical Pharmacology and Therapeutics*, **42** (5), 481–4.
21. Jack, D. B. (1983) The University of Tartu (Dorpat) 1632–1982: a review of its contribution to the pharmacological sciences. *Trends in Pharmacological Sciences*, **4** (3), 99–101.
22. Fisher, J. W. (1984) The influence of Dorpat on modern pharmacology. *Pharmacologist*, **26**, 31–6.
23. Charlesworth, F. A. and Griffin, J. P. (1988) *A brief guide to the European directives concerning medicines.* ABPI (Association of the British Pharmaceutical Industry), 12 Whitehall, London SW1A 2DY.
24. Cockfield, Lord (1987) Proceedings of the symposium of the Advisory Committee on Medical Training to the Commission of the European Communities: *Medical training in the European Community—history and prospects—The training of the doctor in the 21st century*, held in Brussels on 18 and 19 June, 1985. New York, Heidelberg, Berlin: Springer-Verlag.
25. Commission of the European Communities (1986) Proposal for a Council Regulation (EEC) relating to a research and development coordination programme of the EEC in the field of medical and health research (1987–9). Com (86) 549 final catalogue number CB-CO-86-525-EN-C. ISBN: 92-97-18509-0.
26. XXIVth Congress of the European Dialysis and Transplant Association—European Renal Association, Berlin (1987). Combined report on regular dialysis and transplantation in Europe, XVII.
27. Black. D. (1988) NHS is in safe hands. *Hospital Doctor*, 5 July.