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## The Changing Face of Medical Practice

F. A. Boddy

### Abstract

Medical Practice has seen considerable change in the past century: during this time there has been a greater revolution in medical standards and activities than in the whole previous history of the profession. Medicine has evolved from the gentle art of the eighteenth century to the practice of the precise rationalism of the present day. In applying the techniques of modern science, Medicine has involved itself in almost every aspect of our environment and is becoming more and more a major factor in human ecology. The purpose of this article is to attempt to evaluate, albeit very briefly, the manner in which this change has come about.

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# THE CHANGING FACE OF MEDICAL PRACTICE

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By F. A. BODDY

Medical Practice has seen considerable change in the past century: during this time there has been a greater revolution in medical standards and activities than in the whole previous history of the profession. Medicine has evolved from the gentle art of the eighteenth century to the practice of the precise rationalism of the present day. In applying the techniques of modern science, Medicine has involved itself in almost every aspect of our environment and is becoming more and more a major factor in human ecology. The purpose of this article is to attempt to evaluate, albeit very briefly, the manner in which this change has come about.

The baseline of modern medicine may best be drawn in the Middle Ages. The legacy of superstition and mysticism of the Dark Ages, which influenced all branches of learning and which reduced critical enquiry to its lowest ebb, had almost obscured the essential philosophy of the ancient physicians at this time. The physician merely followed the teaching and instruction of the established ancients without true criticism or even doubt. Roger Bacon expounds the faults of the period in his essay: "On the Errors of Physicians" . . .

"Physicians give themselves up to disputes about numberless problems and useless arguments and give no time to experience as they ought. . . . They multiply infinite and casual questions and still more infinite dialectic and sophistic arguments in which they get absorbed so that they are ever seeking and never finding the truth. For discovery is by the path of sense, memory, and experience—especially in the applied sciences of which medicine is one."

It was about the ancient authorities that the "schoolmen" argued and debated—but it was not debate about the fundamental truth of their theories: to be acceptable an idea must have proof from established authority. This was a discipline closely allied to, and conditioned by, a church that was at this time preoccupied with the problems of imagery and symbolism. The age of chivalry had little time for originality.

The academic upheaval described as the Renaissance constituted a complete upheaval in almost all philosophical attitudes. Its scientific aspects are paralleled by successful political and theological challenges to the supremacy of the church—seen, for example, in the activities of Henry VIII and Martin Luther. Within this general trend to more liberal ideals there came a revision of established views and a distrust of established authority. In medicine this is seen in publication of *De Humani Corporis Fabrica* by Vesalius and is well summarised by Harvey in the Preface to *De Motu Cordis* . . . :

"I profess," he wrote, "to learn and teach, not from books, but from dissections; not from the positions of philosophers but from the fabric of nature."

With the discovery of the circulation of the blood in the seventeenth century, and, more important, with the acceptance of this theory and its substantiation during this century, came the acceptance of the empirical, "observational" approach to medical practice. Vesalius and, later, Harvey, in their effect on biological science are comparable to Copernicus and Galileo in their service to physical science. All found expression in the philosophy of Francis Bacon. Bacon insisted on two requisites for scientific knowledge: first, the purging of prejudice, and second the importance of combining empiricism with rationalism and careful observation with valid reasoning—in short, a sound methodology. These ideas gained gradual acceptance as the basis of scientific thought and were fully established by the middle of the eighteenth century. Since then they have exerted a slow, but profound effect on medical practice for they form the basis of modern thinking.

Despite the advances of biology, medicine itself saw little change before the beginning of the eighteenth century. The whole nature of the community had changed in the preceding hundred years. It was to change even more dramatically before the century was done. The eighteenth century was an age of secularism—of an interest in the world and its doings; it was an age of rationalism—confident of the competence of human understanding and not needing to rely on the dogmas of others. Lastly, it was an age that accepted the natural order of things without any need for magical interference. Such attitudes were found in Athens at the time of Aristotle: they constitute a mentality which permitted free thought and tolerance of behaviour.

The eighteenth century applied such an approach to all its problems; it was the earnest endeavour of its citizens to make their age "the age of reason in all things," to secure free expression and to resist State interference in all their activities and beliefs. One result of this was a closer rapprochement between science and technology: demonstrated by the Agricultural and Industrial revolutions. Medical practice shared in this rapprochement and, whilst the fundamentals of the basic medical sciences were still largely unappreciated, the opportunities offered by scientific discovery were recognised and used to advantage.

It is at this stage that the beginnings of modern medical practice become evident—notably in the writings of Thomas Sydenham. The problem of the eighteenth century physicians lay in the philosophical differences between the theorists on one hand and the empiricists on the other. The latter adhered to the Baconian ideal; the former rejoiced in hypothesis and conjecture. The attitude of the empiricists, championed by Sydenham, slowly received almost universal adoption. "It is my nature," says Sydenham, "to think where others read; to ask less whether truth would agree with me than whether I agree with Truth."<sup>1</sup> Such an attitude was appropriate and desirable at the time; it was to have interesting and far-reaching effects. Its adoption in the eighteenth century produced the applied sciences of Pathology and Bacteriology, the revision of the pharmacopœia and a revolution in medical education.

Practitioners of medicine were of many sorts falling roughly into two groups: the physicians and the chirurgon-apothecaries. Only the former possessed academic qualifications, usually obtained on the continent and often of doubtful quality.

The chirurgon-apothecaries were the General Practitioners of the eighteenth century. They were trained by apprenticeship for three years. At the end of this time they were examined and licensed by the various

<sup>1</sup> In the preface to Sydenham's *Treatise on Gout*.

Incorporations authorised to do so. Standards were very low, there was little or no theoretical teaching and no organised instruction. Alexander Monro, who started teaching in Edinburgh in 1724 was the first in Scotland to teach medicine in the modern sense. Many apprentices did not bother to become licensed for, as Graham<sup>1</sup> points out, "the threats of a few surgeons in Glasgow could not frighten quondam apprentices from posing as full-fledged doctors in Galloway or hinder them dispensing their hideous drugs in Inverness."

Such a state gradually gave way to higher standards. The outstanding feature of eighteenth century medicine was the development of hospitals which provided facilities for clinical teaching and permitted more organised study of disease and its clinical presentation. The foundations of this system of medical education were laid in the middle of the seventeenth century by Sylvius de Boe, Professor of Medicine at the University of Leiden. This beginning was taken up by Boerhaave: a man who was, in the words of an eighteenth century writer,<sup>2</sup> "an ornament of his profession and of his species." His sympathetic approach to the patient, his desire to understand disease from his own observations and his refusal to accept fanciful doctrines inspired great confidence. His enthusiasm as a teacher inspired his students --and it is there that his greatness lies for he was the inspiration of a group of students through whom he influenced the development of medical practice. The great medical schools of Gottingen, Vienna, Edinburgh, Paris and London, founding a new tradition in medical education, received their inspiration from Leiden.

One of the major advances resulting from the empirical approach to Medicine came from Jenner's observations on cow-pox vaccination for small-pox. Even though the mechanism of infection was unknown, it had been appreciated from the fifteenth century that many diseases were infectious. By observing the natural history of small-pox and by experiments based on these observations Jenner gave the world an antidote against "a disease that has ever been considered the greatest scourge of the human race." The pharmacopoeias of the period also show the gradual change from the enthusiastic decoctions of an earlier age to a more rational therapy based on observed effect.

In the early nineteenth century these trends continued. Empiricism flourished despite the romantic atmosphere induced by such potent influences as the French Revolution and the Napoleonic Wars. The romantic ideal of the nation reappeared, patriotism was reborn. Pope gave way to Shelley and Tennyson, Wagner composed the *Meistersinger*. The classic dignity of Georgian mansions was replaced by the eccentricities of a "Gothic revival." The sciences did not succumb to this spirit and medicine remained in a position to benefit the social developments concomitant with the general mood. That science remained independent permitted rapid developments in technology. Medicine, as always, remained closely bound to both. The development of Dollond's achromatic microscope enabled advances in pathology and bacteriology. The invention of photography in 1827 had potential significance. The study of organic chemistry was begun. The medical researchers were often engaged in scientific studies at the same time and so there was rapid investigation on the medical potentialities of developments in physical sciences.

Pasteur's demonstration of the germ theory and the achievements of

<sup>1</sup> H. G. Graham: *Social History of Scotland in the Eighteenth Century* (Chapter on Medical Education). Edinburgh, 1896.

<sup>2</sup> *Monthly Review* 16, p. 97 (1757).

bacteriology in general during the latter half of the nineteenth century with their derivatives of sterilisation, vaccination, immunisation etc., gave rise to the concept of specific aetiological factors in the causation of disease and induced a search for antidotal curative agents—the “wonder drugs” of the lay press. This approach has produced results that appear eminently satisfactory. By the turn of the century the micro-organisms of most of the infestive diseases had been isolated. Anaesthesia and aseptic techniques were well founded. Since then a palliative pharmacopoeia has been restocked with a host of remedial drugs. The science of nutrition has been mastered in its essentials. Endocrinological disease, notably diabetes and the thyroid disorders can now be controlled. Antibiotics are potent against infection.

In the administration of hormones or nutritional factors the physician replaces or fortifies the patient's metabolism. In prescribing antibiotics he protects the patient from the threat of a parasitic micro-organism. In each case he is applying a specific antidote to combat the immediate causal factor producing the diseased state. Whether in terms of the modern community this concept of therapeutics is adequate merits later consideration. To appreciate its full significance it is necessary to review measures designed to protect the public's health.

The origins of state medicine are well stated by Sir Arthur McNalty<sup>1</sup>: “Humanitarians and men of good will, looked on the social evils about them, the disease, and poverty which affected a large proportion of the community and was responsible for prevailing unrest and misery. They enquired of the medical profession whether these calamities were preventable, and as soon as certain medical pioneers informed them how much could be done to combat disease, a small but influential body of public opinion arose which brought pressure to bear on Parliament and made health an issue of practical politics.

The eighteenth century saw few attempts at sanitation. Disease was widespread and, despite an expanding economy, disease and death rates rose continually. Between 1740 and 1760 the death rate in London greatly exceeded the birth rate. It is estimated that for certain years 74% of all children born in that city died under two years of age, accounting for about half the total deaths. There were extreme degrees of poverty, drunkenness and depravity. The lack of governmental or judicial control left things in the hands of private citizens. The only exception to the general indifference to public health was in the fear of epidemics: quarantine laws appeared in the seventeenth century though prevailing conditions made effective control impossible.

General conditions tended to improve after about 1750. Prosperity brought new and better building. Cheap cotton improved clothing. The drainage of fenland in rural districts, associated with improvements in agriculture decreased the incidence of malaria. The activities of medical humanitarians led to the founding of hospitals and dispensaries, all of which relied on private support. A significant advance was in the field of maternal and infant welfare, both of which engaged the attention of the profession at large for the first time about 1740.

John Robertson of Edinburgh was one of the first to point out the utilitarian aspects of public health. The statesman must consider the effect of disease on the “productive powers” of all classes, he argued; “let him calculate the decrease of a country's wealth from this subtle, active and wide-wasting destroyer.” These ideas made little impression, partly because

<sup>1</sup> Sir Arthur McNalty: *The History of State Medicine in England*.

the Malthusians continued to preach the dangers of an increasing population. The death rate, which had fallen after 1760 began to rise after 1800. The romantic spirit, the war and its aftermath, and a reaction against political and social liberalism prevailed, but in 1831 a force far greater than humanitarianism appeared: the spectre of Asiatic cholera advancing on an unprotected Europe created a great and effective demand for social health control. When cholera reached Paris there were 7000 deaths in 18 days. It was quickly apparent that medicine held no cure and that isolation and quarantine were of little use. In Glasgow, closing the pulpits had no minimising effect. The need of some sort of prophylaxis was then given greater emphasis and it seemed that fresh air, cleanliness, pure food and water offered protection. A long series of smaller epidemics of both cholera and typhoid kept the demand alive: the great sanitary reforms of the nineteenth century were begun.

The social reform movement were not slow to take advantage of the prevailing wind and reform followed. Liberal thoughts were again coming to the fore politically. Trade Union activity began. The connections between Liberalism and health reform are again seen in the sympathies of Virchow for the revolution of 1848 and the framing of Engels' indictment of English society largely in terms of unnecessary disease and death. Simon summed up the situation in his book, *English Sanitary Institutions*:

"If given wages will not purchase such food and lodgement as were necessary for health, the ratepayers, who sooner or later have to doctor, or bury the dead labourer, when starvation or filth diseases have laid him low, are, in effect paying the too late arrears of wages which must have hindered these sufferings and sorrows."

The weight of propoganda was considerable and the movement grew. It did in fact make health an issue of practical politics. Between 1850 and 1900 there were 27 Acts of Parliament dealing with houses alone. The establishment of the Local Government Board and the appointment of Municipal officers of health between 1870 and 1900 mark the growing importance of the subject. The influence of bacteriology was great, the discovery of the causative organisms of infectious disease inspired greater activities of preventive medicine. Later National factors play an increasing part.

The ultimate realisation by Parliament of the validity of Robertson's arguments of a century earlier was the creation of the Ministry of Health in 1918 "for the purpose of promoting the health of the people." Such an action was principally a political advance but it received a spur from the experience of the war, from a realisation of the problem of venereal disease and tuberculosis and from the fact that almost one in five of the recruits to the war-time army were found unfit in one or other respect.

The National Health Insurance Act of 1946 constitutes the most recent landmark in the evolution of socialised and preventive medicine. It allied this aspect of practice with its remedial opposite; it brought into being a rapprochement between the profession and the community it serves for the change from "private" to "state" practice on this scale has one great advantage. Medical practice is now to a large extent freed from the economic ties of the past and has greater facilities for expansion than ever before. It is thus enabled to advance its influence in the community and more thoroughly exploit what has been termed "the matrix of medicine."

The bilateral progress of remedial and preventive medicine in the past century has produced great changes in the structure of our society. In this respect improvements in commerce, agriculture, education and housing, which may indeed have played the larger part, should not be overlooked.

Leprosy, malaria, smallpox—the diseases of the Middle Ages—have been eradicated. Cholera, typhoid and typhus and diphtheria—the diseases of the industrial revolution—have disappeared. Another of these, pulmonary tuberculosis now stands low in the tables of mortality. These are the triumphs of the medicine inspired by Sydenham and evolved in the eighteenth and early nineteenth centuries. In the past fifty years the expectation of life at birth has increased by more than 17 years, yet in assessing the influence of medicine in the community we should be as much and more concerned with the influence of disease than the incidence of death. Preventing a man from dying and yet failing to make him well enough to “live” is not satisfactory therapy. Examining the increase in life expectancy we find that the gain is not shared by all. The increase at 20 years is only 6·8 years, at 40 it is but 3 years and at 65 but one. Thus we are carrying to the third, fourth and fifth decades many of those who, in former years, would have died earlier. Data concerning persons with chronic diseases in the United States demonstrate that, whilst these people live longer, they are not better organisms. One sixth of the population is thus affected. More than half are under 45 years of age.

We are faced with the conversion of mortality to morbidity and the challenge of an ageing population. Taking 1935 as a standard of 100%, a Baltimore survey estimated that the services of physicians for cases lasting seven days or more, and resulting from chronic diseases in an ageing population would increase to 130% by 1960 and 150% by 1975. These are staggering figures.

The overwhelming emphasis on immediate causal agents of disease has produced results in the treatment of specific conditions. The classical diseases are gone. On the other hand, medical practice has fallen short of its objective ideal of the elimination of disease and the promotion of health. Queues in both doctors' surgeries and out-patient departments grow longer. Hospital wards are filled with what is commonly termed “poor teaching material.” These are the symptoms of communal disease and increasing morbidity. The physician neglects his art in the pursuit of intricacies of specialisation and the minutiae of physical diagnosis. I cannot believe that the control of disease can come from the study of specific entities or from the pursuit of physical investigation—for the true cause of disease is not here. Only temporary benefit can accrue from pondering the raised serum cholesterol of an individual with atherosclerosis. It is as pertinent and as important to ask why the incidence of cardiovascular disease has doubled in fifty years. We should not seek the reason for the increase in bronchogenic carcinoma in cigarette smokers but in the reason for the increase in cigarette smoking in recent years. Here, and in the deeper strata of human behaviour, we may seek the causation of disease. Medical practice must explain why one man should succumb to infection whilst another is unaffected. It must explain the causation of epidemics and the reasons for their varying severity. It must understand and treat the rising endemic of stress disorders. It must recognise the symptoms of disease of the community and attempt to correct the condition. Answers to these problems are already being sought: there is a growing awareness of the concept of social medicine and an increasing appreciation of the place of stress—or maladaptation to environment—in the causation of illness. The development of these concepts will affect the development of Medical Practice. Only as they are appreciated and pursued and only when the practitioner comes to treat man in, and in relation to, his environment, can medicine, in terms of its remedial and preventive approaches, proceed to overcome the problem of communal morbidity.