

MEDICINE THROUGH THE AGES

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ABSTRACT

History of medicine chronologically traces its development from guesswork about the actions of prehistoric man through the centuries to some aspects of the present day. The intellectual and cultural centres of the world have moved over time to time from place to place. In earlier times all knowledge was part of a conglomerate which one polymath might be able to master in a way no longer open to anyone now. The history of medicine through the ages has been presented here under different subdivisions, such as - The Past, The Middle Ages, The Twelfth century Renaissance and Medicine and the Renaissance (Newton's century) etc.

INTRODUCTION :

Medicine is always related to its life and times and springs from and adds to its intellectual environment in any particular age. History of Medicine chronologically traces its development from guesswork about the actions of prehistoric Man through the centuries to some aspects of the present day. The intellectual and cultural centres of the world have moved over time to time from place to place. Not only have they dominated socially, economically, politically and militarily, they have also carried the arts, sciences, humanities and philosophies with

them, whether or not, they are now deemed to have progressed or regressed in these various endeavours. It is of importance to recognize that progress in medicine, as we visualize it, rarely, if ever, occurs in isolation. It follows in the wake of and is part of general progress. Civilizations seem to advance on many fronts at once. They develop an intellectual climate which feeds and sustains, and is exemplified, in several fields, with ideas crossing and re-crossing boundaries between subjects. In earlier times all knowledge was part of a conglomerate which one polymath might be able to master in a way no longer open to anyone now.

These omniscientists, often thought of as philosophers, moved easily from speculation to practicality, from art to science and from peace to war. They were, by our standards, relatively unconfined and free to move over the range of human existence as then known. This shows one of the historically persistent patterns in the move from generalization to specialization over long periods of time.

The Past :

From primitive Man the move is to the first civilization of the Indus Valley in India (2500-200 BC) and the Fertile Crescent of Mesopotamia (2000-539 BC) bounded by the valleys of the rivers Tigris and Euphrates, ancient Egypt (3000-400 BC) and China. Archeologists have found out that priest doctors in ancient India used spells, herbs and spices to cure diseases. Surgeon Suśruta (400 AD) listed about 100 surgical tools.

Indian Ayurvedic medicine as described in Atharvaveda dates as far back as second millennium BC. The golden age of Indian medicine when "Caraka-Samhitā" and "Suśruta-Samhitā" were compiled respectively by Caraka—a physician and Suśruta—a surgeon dates between 800 BC and 1000 AD. Experts believe that there was certainly intercommunication between Greece and India before the time of Alexander the Great

The Chinese system of medicine is of great antiquity (c2953 BC) and is independent of any recorded external influence. The canon of internal medicine was written in the book—"NEI CHING"—still considered to be a great authoritative text on Chinese medicine.

TABLE I shows "EVOLUTION OF HIPPOCRATIC MEDICINE"

TABLE II shows "CHRONOLOGY OF THE HISTORY OF MEDICINE"

The first awakening of medicine, for present purposes, belongs to the time of classical Greece, when medicine was based essentially on the teachings of Hippocrates (460-377 BC) and his followers. This might be said to extend roughly from his birth c460 BC to the decline of Greece and the dominance of Rome in the few centuries till 400 AD around the dawn of the Christian era. At this time the intellectual centre for medicine moved from Athens (800-300 BC) to Alexandria and then on to Rome (700 BC-400 AD). However, it is not to be thought that the theories practice of medicine important to us were in any way confined to these cities. Their influence and culture spread far and wide through the known world, and especially along the shores of the Mediterranean.

THE MIDDLE AGES (400-1500 AD):

With the decline of Rome came the Middle Ages (500-1500 AD) based in feudalism and dominated by the church which had a virtual monopoly of knowledge and learning. As regards medicine the clergy did little in this period, for it was the age of Scholasticism concerned with religious dogma and interpretation. But in the early part of the period c600-700 came the rise of Islam, and Arabic physicians preserved and advanced the earlier Greek medicine, so that its ideas and methods were extant again along the northern and southern shores of the Mediterranean as far as Spain and Morocco from the base in the Middle East.

"THE TWELFTH CENTURY RENAISSANCE" AND MEDICINE :

During the Middle Ages, there was little progress in medicine in Europe due to fall of Roman Empire (700 BC-400 AD) and the influence of the Church which believed that disease was a punishment from God. But there was a flicker of light even in that Dark Ages. In mid 900's a famous medical school had grown up at Salerno thirty miles south of Naples in Italy. Men and women of all races were trained as doctors there. Salerno was the first place to use the term "Doctor of Medicine". Later on Medical Schools came up in Paris (1110 AD), Bologna (1158),

Oxford 1167, Montpellier (1181), Cambridge (1209), Naples (1212), Padua (1222) and in many other places in France, Spain and Switzerland. Medical school at Salerno trained first group of "women doctors" during tenth and eleventh centuries. First woman to become a "Doctor of Medicine" in modern medicine was an American-Elizabeth Blackwell (1821-1910) trained in Paris School of Medicine in 1870 as no British or American University would have allowed her to study "Medicine" in those days. First British lady doctor (not a university graduate) was Elizabeth Garrett Anderson (1836-1917) granted a licence in 1865 by the Society of Apothecaries to practise medicine in London. First lady doctor in India was Kadambini Ganguly (MBBS, 1880) trained at the Medical College, Calcutta (Established in 1835). She, later on, continued her further medical education in Edinburgh.

It is interesting to note that, in contrast to the Christian belief on human health and disease during the Dark Ages (400-1100 AD), the Holy Koran encouraged the study of medicine: "O servant of God, use medicine because God hath not created a pain without a remedy for it." Hence, the Arabian physicians kept the flag of Greek medicine flying.

THE RENAISSANCE (NEWTON'S CENTURY) (1500-1700 AD) :

The yoke of Scholasticism on medicine began to be thrown off with the Renaissance around the fifteenth century. This was essentially based in northern Italy, and saw the beginnings of sound observational anatomy. The real scientific era had then begun. The intellectual spirit of the Renaissance spread throughout Europe and especially northwards to Paris, Holland and England, as well as into Switzerland and Germany and the Scandinavian countries. And early in the seventeenth century William Harvey (1578-1657) published his work on the circulation of the blood and the motion of the heart, (*De Moto Cordis et Sanguinis*, 1628). This was the result of observation, inference and most significantly experiment, so that another dimension was added to medical advance. Later in the seventeenth century Isaac Newton (1642-1727) revolutionized the whole way of looking at the physical world, with profound consequences for natural science, including medicine.

CENTURY OF ENLIGHTENMENT :

The eighteenth century brought further advances, especially in midwifery with the advent of the obstetric forceps, and the scientific approach of John Hunter (1728-1793)

to surgery. Almost unconsciously the methods of observation, careful recording, inference, hypothesis and experiment had been learned from the pioneers and were being applied in a variety of directions and subjects. Chemistry had begun to progress as a result of the researches of Boyle (1627-91), Hooke (1635-1703), Priestley (1733-1804) and many others. The French Revolution in 1789 (July 14) totally reshaped medicine. Within three tumultuous decades much of what we now take for granted had become the hallmark of the new medicine pioneered in France. Antoine-Laurent Lavoisiers (1743-1794) epic work—"the Method of Analysis" was published in 1789, in which he introduced the concept of chemical element that was to revolutionize chemistry. Lavoisier's physician friends—men such as Pierre Jean-Georges Cabanis and Phillipe Pinel, both members of French National Assembly wanted to apply the new philosophy to studying disease. In the first National Assembly after the French Revolution, 28 of its members were doctors; the equivalent number in later Convention was 49. Cabanis even declared that sick bodies could be expected to lead to sick ideas and sick societies; in his view, medicine had to be at the heart of social reform. Here, actually lay the seeds of social concept in modern medicine of today.

CENTURY OF EVOLUTION (DARWIN'S) :

The nineteenth century was dominated by Charles Darwin (1809-1882) who changed the way of looking at the living world, just as Newton had done for the physical world. It is impossible to estimate just how much these two have brought about in the later working out of their ideas, experiments and speculations. But the later nineteenth century saw the beginnings of bacteriology and of cellular pathology, and by the turn of the century psychiatry had started, largely as a result of the work of Sigmund Freud (1856-1939) and many others.

CENTURY OF SPECIALIZATION :

The twentieth century has been the age of specialization as scientific knowledge and its applications have burgeoned. About the middle of the century came the therapeutic explosion based on increasingly rational pharmacy and the application of physics and chemistry and other sciences and technologies in the service of medicine.

The history of thought is that of a slow shading off of one form into that of another, almost imperceptibly. Ideas and actions, consonant with their times, arise and diffuse, and thereafter may flourish, stagnate, die or lie torpidly until awakened once more when the time is ripe.

The general course of the history of medicine is from massive speculation—without allowing it to be much influenced by fact, as observed or derived from experiment—to narrower and narrower smaller hypotheses, potentially testable by observation and experiment. There is a move too from supernatural to natural explanations of phenomena; and it all takes a very long time, with the old clinging to the new, impeding its progress and having to be discarded as time passes, so that novel and fruitful ways of looking at events may emerge and be tested. In short, medicine is one aspect of the development of scientific method being applied in one of the most difficult areas of nature. For medicine has little justification except as a practice. It must be a practical art, or science, or both.

In slightly more specific terms the mind concerned with medicine first speculates about a problem, then tries to solve it empirically with the tools available at the time. In the earliest times these tools could only be some modifications of the diet, bathing, rest and sleep, with perhaps some potions of doubtful value. In investigations too, as far as these were undertaken, there was little at hand that could be used. But then there may come technological advances, perhaps outside medicine, which may be applicable within it. An hypothesis can be tested and may

have to be modified by the facts disclosed by the new technique, and then that in its turn may have to be modified. There is constant interplay between hypothesis and technology. It is obvious enough that cellular biology and pathology were not possible until the microscope had been invented and that the further development of electron microscopy had to wait on the appropriate moves in electronics. The whole gamut of investigational and many therapeutic techniques, so prominent a feature of modern medicine, have come from technological advances, not normally thought of as belonging within the usual definitions of medicine. And whole specialities have grown out of some of these techniques.

Sometimes progress may occur because of a change in social attitudes. Such was needed before anatomy could be undertaken, when the human body was no longer seen as totally sacred. And it is social changes that have made termination of pregnancy more acceptable today.

We receive and use gifts from the past of which we are often unaware. Many of them now form the basis of today's theory and practice of medicine. They were hardly won in their time, though now they are rightly taken for granted and used because they are established. The miracles and breakthroughs of today will in their turn become the

commonplace of tomorrow, and that we are no less prone to error than our ancestors were, and which only our progeny will recognize.

THE LIMITATION :

It is true that until the great discoveries of the 19th and 20th centuries, physicians were almost helpless before nearly all maladies. The best they could do was to comfort the patient until nature cured him. French surgeon and Father of modern surgery, Ambroise Pare's (1510-1590) saying was—"Je le pansait; Dieu le guarit" (I dressed him; God healed him). It was a fine statement of the creed of the surgeon in aiding and not frustrating the "vis medicatrix naturae".

There has been tremendous advancement in the field of public health, anaesthesia, infective diseases and many other branches of medicine. But it is a tragedy that the message of modern medicine has not reached the vast masses of people in many parts of the world.

Even now little can be done for important maladies, including degenerative conditions of brain, vascular system, various cancer, the virus infections and many kinds of psychiatric disorders. The first doctors or "medicine men" were witch doctors. The use of charms and talismans, still prevalent in modern

times, in many parts of the world carries the rhythm of the folklore of medicine—the most ancient aspect of the art of healing. Achievement in modern medicine is significant but there is still a long way to go.

THE PHILOSOPHY :

The philosophical problem of the late twentieth century in medicine is the assumption that science, with the technology it spawns and derives from, will provide the answers to illness and the preservation of health. The success of the scientific approach has been so great in the past hundred years that it would be surprising if that assumption were not made. In an historical perspective the belief would seem to be unrealistic. Science will continue to have its triumphs but they will not be and cannot be all-conquering. The opposition to this naive idea is already building up. "There are more things in heaven and earth, Horatio, than are dreamt of in your philosophy" so commented William Shakespeare (1564-1616) in his "Hamlet".

Education is conventionally divided up into knowledge, skills and attitudes. Knowledge and skills are the provinces of science and technology. As we have seen these proceed apace in medicine. There is

no stopping them, even if that were desirable. The momentum is such within medicine that they will continue to flourish and can be left to take care of themselves, as they undoubtedly will. It is attitudes both inside and outside medicine, however, that should be the present concern. It is they that determine how, when and where knowledge and skills should be and will be exercised. These two give evidence about what can be done, but not whether and how much they should do. This is why philosophy, in the sense used here, is so important to medicine. Ideas and especially systems of ideas are the substrate on which actions are based, even though there are dialogues between ideas and actions. Actions do not just arise. They have a background in thought. This can be inexplicit and later obscured by the results of action.

THE MESSAGE OF MEDICINE :

The next move in medicine, already begun, will probably be to make a more formal consideration of attitudes to it and within it. History and philosophy are necessary ingredients in the understanding and direction of medicine in the future, so that it might continue to serve society and remain in valuable relationships with it.

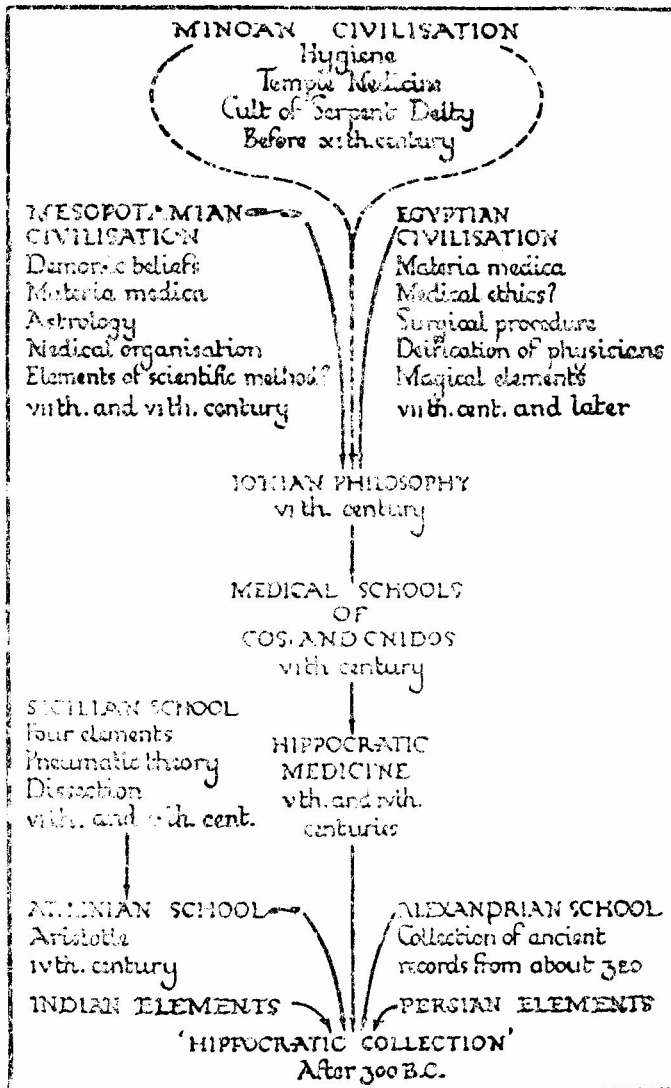


TABLE - I: EVOLUTION OF HIPPOCRATIC MEDICINE.

TABLE - II: CHRONOLOGY OF THE HISTORY OF MEDICINE

Years	Eras	Individuals	Events and trends
10,000BC 3,000BC	Prehistoric	None that we know about	Belief in magic — charms, spells, etc. Primitive surgery — trephining. Use of plants, roots and berries as medicines. Ideas about medicine limited by supernatural view of world. Problem for historians of no written evidence.
400BC	Egyptian Chinese Greek Babylonian Indian	Imhotep Asclepius Hippocrates	Egyptians — superstition mixed with a more scientific approach. Use of drugs and preservatives — embalming. Very aware of hygiene — washed frequently. Settled way of life helped ideas to develop and they were written down. Religious beliefs stopped them using dissection, so they knew little about how the body worked. Greeks — strong supernatural beliefs but believed in hygiene and fitness. Philosophers and doctors studied the human body at Alexandria where dissection was permitted. Beginnings of medical schools. China — discoveries made here long before Europe. Use of acupuncture. India — skilled surgeons. Babylon — one of the first cities to have public health facilities.
400AD	Roman	Galen	Importance of public health — sewers, drains, aqueducts and public baths. Military hospitals. Spread of Empire meant spread of ideas. Large number of unqualified doctors meant that most were distrusted.
1500AD	Dark Ages and Middle Ages	Avicenna Rhazes Albicasis	Little progress in medicine in Europe due to fall of Roman Empire and influence of Church which believed that disease was a punishment from God. Black Death. Arab Empire — centre of medicine. Growth of medical schools — Salerno and Cairo.
1700AD	Renaissance	Vesalius Paré Harvey Paracelsus Sydenham	Increase in books and travel encourages spread of ideas. Study of anatomy becomes more common. Much greater awareness of causes of disease and way the body works.
1900AD	18th and 19th Centuries	Jenner Pasteur Simpson Lister Semmelweis Nightingale Koch Chadwick Freud	Industrial Revolution — growth of towns leads to overcrowding. Public Health Acts in Britain (1848 & 75) passed to improve sanitation and prevent the spread of disease. Growth of hospitals. Improvements in nursing. Rapid progress in all areas of medicine in 19th century — understanding of germs, use of chloroform in surgery, vaccination, etc.
2000AD	20th Century	Ehrlich Manson Fleming Barnard	Much greater understanding of disease and its treatment including syphilis, TB, diphtheria and malaria. World wars lead to improvements in drugs, surgery and the fight against disease. World Health Organisation — spread of health education and prevention of disease in Third World. Use of high technology in Western hospitals.

NAME INDEX WITH CHRONOLOGY

(Appendix to Table II)

Up to 400 B.C. :

Imhotep (c. 500)	—	First "Medicine Man"
Asclepius (c. 150)	—	God of "Temple Medicine"
Hippocrates (460 – 370)	—	Father of Modern Medicine

Up to 400 A.D. (Roman) :

Claudius Galen (131 – 201)	—	Physician / Anatomist
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Up to 1500 A.D. (Dark Ages/Middle Ages) :

Avicenna (980 – 1036)	—	Physician
Rhazes (860 – 932)	—	Physician
Albucasis (1050 – ?)	—	Surgeon

Up to 1700 A.D. (Renaissance)

Andreas Vesalius (1514 – 1564)	—	Physician / Anatomist
Ambroise Paré (1510 – 1590)	—	Surgeon
Paracelsus (1493 – 1541)	—	Physician
William Harvey (1578 – 1657)	—	Physician
Thomas Sydenham (1624 – 1689)	—	Physician

18th and 19th Centuries :

Edward Jenner (1749 – 1823)	—	Physician
Louis Pasteur (1822 – 1895)	—	Bacteriologist
James Young Simpson (1811 – 1870)	—	Anaesthetist
Joseph Lister (1827 – 1912)	—	Bacteriologist
Ignaz Philipp Semmelweis (1818 – 1815)	—	Obstetrician
Florence Nightingale (1820 – 1910)	—	Nurse
Robert Koch (1843 – 1910)	—	Bacteriologist
Edwin Chadwick (1800 – 1890)	—	Public Health
Sigmund Freud (1856 – 1939)	—	Psycho-analyst/Psychiatrist

20th Century :

Paul Ehrlich (1854 – 1915)	—	Pharmacologist
Patrick Manson (1844 – 1922)	—	Tropical Medicine
Alexander Fleming (1881 – 1955)	—	Bacteriologist
Christian Barnard (1922 – ?)	—	Cardiac Surgeon

सारांश

आयुर्विज्ञान युगों से

सिसिर के. मजुन्दार

आयुर्विज्ञान के विकास का इतिहास पूर्व-ऐतिहासिक कालीन मानव के कार्यों के विषय में अनुमान से प्रारंभ होकर अनेकानेक युगों से गुजर कर आज तक पहुँचा है। विश्व के बौद्धिक एवं सांस्कृतिक केंद्रों का समय-समय पर स्थानान्तरण होता रहा है। युगानुसार आयुर्विज्ञानीय इतिहास को इस लेख में विभिन्न अनुभागों के अन्तर्गत प्रस्तुत किया गया है। जैसे कि पूर्वयुग, मध्ययुग, 12 वीं शताब्दी नवचेतना तथा आयुर्विज्ञान एवं नवचेतना (न्यूटन की शताब्दी) इत्यादि।