

## Origin of Medicine in India and Europe

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**Abstract** - Ancient Egypt possessed an advanced system of Medicine. The knowledge of medicine transmitted to East and West along with the migration of Egyptian communities. Ayurveda, the system of medicine originated in India, acquired its basic concepts from Egyptians and further developed by Aryans. Modern Medicine, developed into a system in Europe, originated in ancient Egypt and Babylonia. Both systems of Medicine bare a common root of thought.

The history of Medicine runs back to the dates of earliest civilizations such as Mesopotamia, Babylonia and Egypt. Linguistic research reveals that the Indu-European speaking people had a common homeland, from which they had migrated to various parts of Asia and Europe.

Ancient Egypt possessed an advanced system of Medicine. The knowledge of medicine transmitted to East and West along with the migration of Egyptian communities. Ayurveda, the system of medicine originated in India, acquired its basic concepts from Egyptians and further developed by Aryans. Modern Medicine, developed into a system in Europe, originated in ancient Egypt and Babylonia. Both systems of Medicine bare a common root of thought.

### **Medicine in Ancient Egypt**

The Ancient Egyptians had possessed a developed system of Medicine. The history of Medicine in ancient Egypt goes back to the period of 1st dynasty (3150-2925 BC). Thoth was considered as the inventor of Science to whom the authorship of ancient Egyptian works on medicine present in Hermetic books is ascribed. The king Orisis and his son Horus (The Egyptian Sun God) were the inventors of medicine.

"Practical Medicine" and "Anatomical Book", the oldest books of Medicine, were written during the

period of 1st dynasty. They had other medical texts of Anatomy, Pathology, Gynaecology, Surgery and Pharmacology. Ebers Papyrus, Edwin Smith Papyrus (1600 BC) and Kahun Gynaecology Papyrus (1825 BC), which include information on medical and surgical treatment, are the oldest Papyri discovered so far.

During this period, Medical Institutes called "Peri-ankh" or "houses of life" existed. The Institute of Imhotep at Memphis was the most famous Institute. The Institute at Sais trained midwives, who instructed the physicians in the art of obstetrics. Peri-ankh of Abydos was a reputed Institute during the period of Ramses IV. Four other Houses of Life were attached to the temples at Bubastis, Edfu, Tel-el-Amarna and Kom-Ombo. Hesyre was the chief of Dentists and Physicians at the time of King Zoser of 3rd dynasty (2700-2625 BC). Peseshet, the Leader of Lady Physicians during the period of 4th dynasty, was renowned as the oldest female physician.

Ancient Egyptians were aware of vitality of heart, the center of circulation, and of respiration, the most important function of the body. They had used magical powers of healing in the management of Heart diseases including angina pectoris and the diseases of lungs. The study on mummies revealed that the ancient Egyptians had a highly developed embalming technique and their Medical men were keen on anatomy.

The developed Indu Civilization emerged between 2600 - 2500 BC and continued to about 1700 BC. According to historical evidences, there existed a communication between Egypt and India before the Aryan migration. The trade between Mesopotamia and India was at its peak during the period of Sargon (2371-2316 BC) and Isin Larsa (2020-1763 BC).

As early as the 3rd millennium BC, India had connection with Mesopotamia and they had shared their pharmacological knowledge. Indians, who were interested in proper management of Health in the community, had received this knowledge from Sumerians.

Rigveda, the oldest literary record of Indian culture, itself is a proof for the gradual development of Ayurveda. Rudra was deified as the best of the physicians and the originator of all sciences. Aswins, the physicians of gods, were the experts in plastic surgery and anesthesia. Aushadi sukta of Rigveda contains the information on medicinal plants, their taxonomy, pharmacological properties and indications. Ayurveda developed as a sub division of Atharvaveda, in which the primary stage of the development of fundamentals is found. The chief conditions, identified as diseases, are fever (takman), cough, consumption, diarrhea, dropsy, abscesses, seizures, tumors, and skin diseases (including leprosy). Archeological evidence proved the existence of cranial surgery. Upanishad contributed much for the development of Philosophy, on which Ayurveda developed.

The classical Ayurvedic texts, Carakasamhiata and Susrutasamhita, considered Brahma as the originator of medicine. Thoth, Orisis, and Horus, the inventors of science and Medicine, are comparable with Brahma. Daksa and Bhaskara learnt Ayurveda from Brahma. Asvins were the disciples of Daksh Prajapati. Nasathya, the name found in a document discovered from Cappodocia of North Western Mesopotamia, was referred as Asvins, who transplanted an artificial iron leg to Vispala. Nasatya was the god of Mltanian culture in Euprates Valley.

The pioneer of Ayurveda among the human was Bharadvaja, Punarvasu Atreya, the disciple of Bharadvaja taught the science to Agnivesha. Dhanvanthari, who developed the surgery, trained Susruta in the specialty of Surgery. A part of his thesis is available as Susrutasamhita. The later texts are the compilations based on both Carakasamhita and Susrutasamhia. Nagarjuna later developed the Rasasastra, a branch mainly dealing with the mineral drugs.

Ayurveda was the most advanced medical system of the world during the period of 1000BC - 200BC. During the period of Agnivesa and Susruta, Ayurveda came to its peak and witnessed a gradual decline.

#### **Medicine in Europe**

Origin of medicine in European countries was parallel to that of India. At the earliest stage, they had inherited to ancient Egypt. Later they acquired the knowledge of medicine from India, Arabia and China and developed up it to the standard existing today. By the 20th century, it had developed rapidly along with the development of natural sciences. It has gained remarkable achievements in every aspect.

Medicine in Europe inherited to Greeks. Ancient Greeks acquired their medical knowledge from ancient civilizations existed in Babylonia, Egypt, India and China. The origin of medicine was attributed to God as in other civilizations. They identified Thoth as Hermes, the sun god Horus as Apollo, who disclosed the science of Medicine. Homer represented the art of healing as it derived from the God. Asclepius, the son of Apollo was also deified as the originator of Medicine. Podaleirius and Machaon, the military surgeons, are accepted as the sons of Asclepius. The divine Asclepius might have originated from human Asclepius, who performed miracles in healing about 1200 BC. In comparison to the development of medicine in India, Ayurveda too had been well established; Asclepius was contemporary to Punarvasu Atreya, Agnivesha, Dhanvantari and Susruta.

Dhanvantari, the Great Surgeon, was also deified in India during the period. Probably they might have shared their medical knowledge.

In the 5th century BC, Empedocles emphasized the view that the universe is composed of four basic elements: Earth, Water, Fire and Air. This concept might have been derived from Buddhism, which accepts the doctrine of Caturmahabhuta instead of Pancamahabhuta of pre-Buddhist philosophies.

Greeks had accepted the four body humors: Blood, Phlegm, Cholera (Yellow bile) and Melancholy (Black bile). The concept of body humors had been illustrated in Ayurveda long before Greeks. Susruta, the disciple of Dhanvantari accepted the blood as a body humor, in addition to Vata, Pitta and Kapha.

Empedocles did not identify the philosophy in the concept of Humors in Ayurveda. He, therefore, misinterpreted the pitta as yellow bile, the vata, black bile and the kapha, phlegm.

Hippocrates, the Father of Medicine, had laid much stress on diet, behaviour, and environment. Aristotle, a pupil of Plato at Athens and tutor to Alexander the Great, was the first Great Biologist, who held inestimable value in the field of medicine. He laid the foundations of comparative anatomy and embryology, and his views influenced on scientific thinking.

Pythagoras (580 – 489) BC, whose chief discoveries were the importance of numbers and the physics of sound, had influenced in the development of new medical thoughts of his time. The Greco-Italian school of Croton, which was founded by Pythagoras, provided the scientific basis for Medicine. Introduction of Mathematics to the field of medicine effected further development of medical science. A famous medical school established in about 300 BC in Alexandria continued as a center of medical teaching even after the Roman Empire had attained supremacy

over the Greek world, and medical knowledge remained predominantly Greek. Democritus, a Greek philosopher, believed that diseases were the contracted or relaxed condition of the solid particles that made up the body and cures were effective in restoring the harmony among the particles.

During 300 BC, Herophilus, one of the two best medical teachers, whose treatise on anatomy was famous, and the other Erasistratus, who was regarded as the founder of physiology, noted the difference between sensory and motor nerves but thought that the nerves are hollow tubes.

Asclepiades of Bithynia (born 124 BC), in contrary to Hippocrates, denied the healing power of nature and emphasized that disease should be treated safely, speedily, and agreeably. He applied atomic theory of the 5th-century instead of Humoral theory. Asclepiades used typically Greek remedies: massage, poultices, occasional tonics, fresh air, and corrective diet. He concentrated on mental disease and distinguished hallucinations from delusions. He prescribed a regimen of occupational therapy, soothing music, soporifics (especially wine), and exercises to improve the attention and memory instead of the insane patients being confined in dark cells.

Aulus Cornelius Celsus wrote *De medicina* in about 30 AD, a classic account of Greek medicine of the time, where he included descriptions of elaborate surgical operations.

During the early centuries of the Christian era, Galen acknowledged his debt to Hippocrates and followed the Hippocratic method accepting the doctrine of humors. He laid stress on the value of anatomy, and he virtually founded experimental physiology. Galen recognized that the arteries contain blood and not merely air. He showed how the heart sets the blood in motion in an ebb and

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flow fashion. Dissection of the human body was at that time illegal, so that he was forced to base his knowledge upon the examination of animals, particularly apes. He introduced Galanical preparations as an advancement of pharmacy. Soranus of Ephesus (2<sup>nd</sup> Century AD) paid much attention to develop Gynaecology, Obstetrics and Paediatrics and introduced methods of contraception in contrary to abortions. Further, he described methods to overcome in delivery by turning the fetus in the uterus.

Romans were keen in maintaining the public health. They established hospitals, which resemble modern design. The army of Rome also consisted of medical officers. The saints were prominent. during the period of 303 AD, with their miraculous cures in the field of medicine. They were honored by identifying certain diseases such as St. Vitus for chorea (St. Vitus' dance), St. Anthony for erysipelas (St. Anthony's fire).

In the 9th century, Greek medical texts were translated in to Latin. Jurjis ibn Bukhtishu and Hunayn ibn Ishaq or Johannitus (809 AD) were the translators of Greek texts. Rhazes, a Persian of 9th century, wrote *Kitab al-haki* ("Comprehensive Book"), and *De variolis et morbillis* (A Treatise on the Smallpox and Measles). Avicenna (980–1037), another Persian, who contributed much for the development of medicine, was called the Prince of Physicians.

Arabian medicine contributed the knowledge of chemistry for the development of medicine in Europe. In the course of their experiments, however, numerous substances were named and characterized, and some were found to have medicinal value.

Abu al-Qasim (Albuçasis), Spanish surgeon did much to raise the status of surgery in Córdoba. He wrote the first illustrated surgical text, which held wide influence in Europe for centuries. Jewish philosopher Maimonides of Córdoba, in the 12th century, the physician of Saladin in Cairo, wrote his work in Hebrew. Latter both texts were translated into Latin.

Vesalius and Gabriel Fallopius contributed for the development of surgery. Ambroise Paré, a royal surgeon, dominated in the field of surgery in the 16th century, was considered as the Father of Modern Surgery.

The medical knowledge developed in Greece transmitted to the other countries, where it gained further development. By the 16<sup>th</sup> century, barber-surgeons in Britain practiced Surgery but latter they founded Royal Colleges of Surgeons in Scotland and England. Physicians and surgeons united in a joint organization in Glasgow, and a College of Physicians was founded in London. In the 16th-century, Paracelsus of Switzerland attempted to bring a more rational approach in diagnosis and treatment, and he introduced the use of chemical drugs in place of herbal remedies.

Girolamo Fracastoro of Italy, a contemporary of Paracelsus, was interested in epidemic infection, and he offered the first scientific explanation of disease transmission. He highlighted, in his work "De contagion et contagiosis morbis (1546), that the seeds of certain diseases are imperceptible particles and transmitted by air or by contact.

William Harvey presented his revolutionary theory of the circulation of blood on the basis of *De venarum ostiis*, the work on valves of veins. In 1628, Harvey published his classic book "Exercitatio Anatomica de Motu Cordis et Sanguinis in Animalibus (Concerning the Motion of the Heart and Blood)", often called "De Motu Cordis" and "Exercitationes de generatione animalium ("Experiments Concerning Animal Generation"), published in 1651, laid the foundation of modern embryology.

Marcello Malpighi of Bologna, who was born in 1628, saw a network of tiny blood vessels in the lung of a frog with aids of primitive microscope. Robert Boyle showed that air is essential to animal life. Richard Lower traced the interaction between air and the blood. In the late 18th century, Antoine-Laurent Lavoisier discovered the essential nature of oxygen and clarified its relation to respiration. Galileo introduced the value of measurement in science and medicine.

The great Dutch microscopist, Antonie van Leeuwenhoek, devoted his life for microscopical studies and was probably the first to see and describe bacteria. In England, Robert Hooke, who was Boyle's assistant and curator to the Royal Society, published his *Micrographia* in 1665, which discussed illustrated microscopic structures of a variety of materials.

Revolutionary ideas were contributed for the rapid development of medicine. Santorio Santorio, a pioneer investigator of metabolism, wrote "De statica medicina" on the importance of Medical Measurement. The thought of the physicians were enlightened with the work "Cerebri anatome nervorumque descriptio et usus (Anatomy of the Brain and Descriptions and Functions of the Nerves)" of Thomas Willis, in 1664.

Thomas Sydenham, the English Hippocrates, revised again the straightforward clinical observation initiated by Hippocrates. He diverted physicians' minds from mere speculation to the bedside, where the true art of medicine could be studied. Samuel Hahnemann, of Leipzig, the originator of homeopathy, introduced a new system of treatment involving the administration of minute doses of drugs whose effects resemble the effects of the disease being treated.

The first organized medical school in Europe was set up at Salerno, in Southern Italy. It drew scholars from near and far, admitted women as medical students. The Holy Roman Emperor Frederick II declared that no one should practice medicine without an approval from masters of Salerno. The Salernitan School also produced the "Regimen Sanitatis Salernitanum" (Salernitan Guide to Health).

In the 18<sup>th</sup> century research and medical education had been increasingly incorporated into the Universities of Europe; Edinburgh became the leading academic center for medicine in Britain; John Hunter and William Hunter, in London, conducted extensive research in comparative

anatomy and physiology, and had founded a new branch of medicine, the surgical pathology and obstetrics. A leading obstetrician in London, William Smellie, wrote on the *Theory and Practice of Midwifery* in 1752–64. He placed midwifery on a sound scientific platform and contributed to establish obstetrics as a recognized medical discipline.

Giovanni Battista Morgagni, of Padua, published his "De sedibus et causis morborum (The Seats and Causes of Diseases Investigated by Anatomy)" forming a base for modern pathology. Public health and hygiene were given more attention during the 18th century. One highly significant medical advance, late in the century, was vaccination. Edward Jenner, a country practitioner who had been a pupil of John Hunter introduced inoculation in 1796.

When population statistics were maintained, suggestions arose concerning health legislation. Hospitals were established for a variety of purposes. James Lind, a British naval surgeon from Edinburgh, recommended fresh fruits and citrus juices to prevent scurvy, a remedy discovered by the Dutch in the 16th century. When the British Navy adopted Lind's advice—decades later—this deficiency disease was eliminated. In 1752 a Scotsman, John Pringle, published his classic *Observations on the Diseases of the Army*, which contained numerous recommendations for the health and comfort of the troops. At the same time, sound throughout Europe and traveled across the sea, where centers of medical excellence were being established.

In 19th century, Knowledge on the structure of the human body was completing, due to advanced methods of microscopy. Even the body's microscopic structure had been discussed. Studies of physiological processes were rapidly developed, especially in Germany, where it became established as a distinct science under the guidance of Johannes Müller,

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a professor at Bonn and University of Berlin, illustrated his discoveries in his famous textbook, "Handbuch der Physiologie des Menschen - Manual of Human Physiology" in 1830s.

Hermann von Helmholtz, a disciple of Müller, who made significant discoveries relating to sight and hearing, invented the ophthalmoscope. Rudolf Virchow, a great medical scientist, who worked on cellular pathology, published the "Die Cellularpathologie" in 1858.

Claude Bernard of France, a brilliant physiologist, explained the role of the pancreas in digestion and revealed the presence of glycogen in the liver. Further he explained the function of vasomotor nerves in controlling the tone of blood vessels. He introduced the field of experimental medicine in his "à l'étude de la médecine expérimentale - An Introduction to the Study of Experimental Medicine" in 1865.

The studies of microbiology were based on the knowledge acquired from India. In addition to the description on pathological macroorganisms and their transmission, Susruta of India, had expressed the idea that some diseases were caused by entering of imperceptible beings into the body, as early as 1000 BC, and the same idea was given by Roman encyclopaedist Varro in 100 BC, Fracastoro in 1546, Athanasius Kircher and Pierre Borel about a century later.

Identification of microorganisms was a remarkable achievement in 19<sup>th</sup> century. Agostino Bassi of Italy, pioneer in the field of parasitology, showed that a disease of silkworms was caused by a fungus that could be destroyed by chemical agents. French chemist Louis Pasteur proved that the fermentation of wine and the souring of milk are caused by living microorganisms. His work led to the pasteurization of milk and solved problems of agriculture and industry as well as those of animal and human diseases. German physician Robert Koch, a pioneer in bacteriology, showed how bacteria could be cultivated, isolated, and

examined in the laboratory. Koch discovered the organism of tuberculosis, in 1882, and cholera, in 1883. By the end of the century many other diseases produced by microorganisms had been identified. In the beginning of 20<sup>th</sup> century, scientists identified a number of pathological microorganisms such as the rickettsias, protozoans and viruses. In 1910, Peyton Rous showed that a virus could also cause a malignant tumor, a sarcoma in chickens.

Patrick Manson, a British pioneer in tropical medicine, explained that insects could carry disease. It was identified that the embryos of the Filaria worm, which cause elephantiasis, are transmitted by the mosquito. Manson explained his views to a British army surgeon, Ronald Ross, who discovered the malarial parasite in the stomach of the Anopheles mosquito in 1897.

Understanding on non-communicable diseases was also developing during the 19<sup>th</sup> century. Richard Bright, contributed significantly to the knowledge of kidney diseases, including Bright's disease, Thomas Addison, gave his name to disorders of the adrenal glands and the blood. Pierre-Charles-Alexandre Louis, Robert Graves and William Stokes introduced new methods in clinical diagnosis. René Laënnec, a native of Brittany, invented a simple stethoscope or cylinder and wrote "De l'auscultation (Mediate on Auscultation)" describing the sounds occurring in the lungs and the heart, in 1819. Leopold Auenbrugger, a Viennese physician, discovered another method of investigation of diseases of the chest, the percussion. Discovery of X-rays in 1895 by Wilhelm Conrad Röntgen turned a new era in clinical diagnosis. Sigmund Freud increased the scientific knowledge in psychiatric, in 19<sup>th</sup> century.

In 1809, Ephraim McDowell operated a woman, without anesthesia or antisepsis, and successfully removed a large ovarian tumor. The most famous contribution from the United States to medical progress was the introduction of general anesthesia, James Young Simpson of Edinburgh, the professor of midwifery, introduced chloroform, the choice of anesthetic at the time.

In the 20th century, witnessed the evolution and progress of national health services in a number of countries, in addition to the advances in diagnosis and treatment. Joseph Lister, professor of surgery at Glasgow University, first introduced the antiseptic principle into surgery. He used carbolic acid as an antiseptic barrier between the wound and the germ-containing atmosphere in 1865. Paul Ehrlich experimented with the effects of various chemical substances on organisms. He inaugurated the chemotherapeutic era in 1910, with his colleague Sahachiro Hata, introducing the arsphenamine (Salvarsan) as a chemotherapeutic agent against the infectious diseases. Salvarsan or one of its modifications remained the standard treatment of syphilis until the introduction of penicillin.

In 1932, the German bacteriologist Gerhard Domagk, announced that Prontosil is active against streptococcal infections in mice and humans. French workers identified the antibacterial agent sulfanilamide of Prontosil. In 1936, English physician Leonard Colebrook and his colleagues provided overwhelming evidence of the efficacy of both Prontosil and sulfanilamide in streptococcal septicemia. The era of new sulfonamides began replacing prontosil with new successors of original sulfanilamide.

Alexander Fleming noticed the inhibitory action of a stray mold on a plate culture of staphylococcus bacteria in 1928. The invention of Penicillin from the mold "penicillium notatum made the dramatic episode in the history of Medicine. Ten years later, Howard Florey, Ernst Chain, and their colleagues isolated penicillin in a form that was fairly pure and demonstrated its potency with relative lack of toxicity. Huge number of antibiotics, derived from microorganisms, were introduced after the new invention of Penicillin, but the challenge against the influence of microorganism remains unsolved.

The magnitude of advancement of science and medicine in 19<sup>th</sup> –20<sup>th</sup> century is so great; all branches of medicine step forward rapidly; the Knowledge on Immunology, Endocrinology and

Oncology contributed for effective management of patients; introduction of advanced vaccination programmes has controlled the dangerous epidemics like smallpox, which has been eradicated from the world. Development of immunology provided solutions regarding some infectious diseases in diagnosis and treatment. Élie Metchnikoff of Paris detected the role of white blood cells in the immune reaction, and Jules Bordet identified antibodies in serum; the mechanisms of antibody activity were used to devise diagnostic tests for a number of diseases - August von Wassermann gave his name to the blood test for syphilis in 1906, and the tuberculin test in 1908; Methods of producing effective substances for inoculation were improved, and immunization against bacterial diseases made rapid progress.

Almroth Wright, English bacteriologist, introduced a vaccine prepared from killed typhoid bacilli for prevention of typhoid in 1897. Emil von Behring and Shibasaburo Kitasato originally prepared the serum of tetanus antitoxin in 1890–92, and it was developed to tetanus toxoid. The diphtheria antitoxin was prepared by Behring and Kitasato in 1890. As the antitoxin came into general use for the treatment of cases, the death rate began to decline. There was no significant fall in the number of cases, however, until a toxin–antitoxin mixture, introduced by Behring in 1913, was used to immunize children. Gaston Ramon, French bacteriologist, introduced a more effective toxoid in 1923. Subsequently it was improved as one of the most effective vaccines in medicine. Albert Calmette, a pupil of Pasteur, and Camille Guérin produced an avirulent (weakened) strain of the tubercle bacillus in 1908. About 13 years later, BCG (bacillus Calmette-Guérin) vaccine against tuberculosis was introduced. Today mass immunization programmes are being practiced throughout the world against various infective diseases as a preventive measure.

The development of various branches of medicine, Anatomy, Physiology, Endocrinology, Immunology, Medical technology, and Pharmacology, in

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the 20<sup>th</sup> century, is inestimable. The achievements, acquired in the fields of medicine and surgery, are remarkable. People enjoy the advantages of the development of medicine gifted by the dedication of Scientists. The rapid progress of medicine in this era was reinforced by enormous improvements in communication between scientists throughout the world. No longer was it common for an individual to work in isolation. Although specialization increased, teamwork became the norm. It consequently has become more difficult to ascribe medical accomplishments to particular individuals.

In Conclusion, we can observe the following similarities, in respect to the origin and development of medicine, in this three civilizations: Ancient Egyptian, Indian and European. The belief of divine origin of medicine is equally found. Brahma, Daksha and Bashkara, the Indian gods, who contributed in the invention of medicine as Thoth, Osiris and Horus of Ancient Egyptians, Hermer, Apollo of Greeks.

Hermer of Greeks presented the knowledge of medicine derived from the god to human as same as Bharadvaja of Indians, Asclepius of Greeks, the son of Apollo, is comparable with Dhanvantari of Indians. Medical thoughts of Empedocles, in the 5<sup>th</sup> century BC, is analogue to that of Indians. Concept of Humoral factors of Greeks, which was probably derived from Ayurveda, laid the foundation for development of modern physiology.

Agnivesa and Susruta illustrated their experimental knowledge in Agnivesasamhita and Susrutasamhita respectively. Present Carakasamhita is the revised edition of Agnivesasamhita made by Drudabala and Caraka. Susrutasamhita was edited by Nagarjuna and Candrata. Since then further development of Ayurveda seems to be stagnant. Vagbhatas, made their compilations Ashtanga Samgraha and Ashtangahridayasamhita on Carakasamhita and Susrutasamhita. Madhava extracted the facts concerned with clinical pathology mentioned in

Carakasamhita, Susrutasamhita and Ashtangahridayasamhita in creating his Madhava nidana. Cakrapanidatta wrote his Cakradatta on the therapeutical view point of Carakasamhita and Susrutasamhita and Ashtangahridayasamhita. Commentators such as Cakrapanidatta, Dalhana, Gayadasa etc. endeavoured in elaborating the classical texts but significant development in the Ayurveda, can not be found so far except the repetition of ancient work. Medicine in Europe was developed rapidly after the scientific revolution. In the 20<sup>th</sup> century, they acquired great achievements in every branch of medicine. Inventions and discoveries in medicine facilitated the human life.

At last we would like to emphasize that Ayurveda possess strong scientific background. Many things, which have not been identified by modern sciences, remain latent in Ayurveda. Declining of Ayurveda is not due to the weakness of its basic principles. In the second millennium, Ayurveda needs the light of logical mind to facilitate the life more and more.

## References:

1. Atharvaveda 5.28.3 In: Sharma, P. V., 1981. *Ayurveda ka Vajjanika Itihasa – (Scientific History of Ayurveda)*. Chaukhambha Orientalia, Varanasi.
2. Basnayaka, H T., 1998. *Ancient Indian Civilization (Singhala)*, M D Gunasena Co. Ltd. Colombo.
3. Bass J B., 1889. *Outlines of the history of medicine and medical profession translated by Handerson H E.* J.H. Vail & Co. New York.
4. Bose D M et al., eds., 1971. *A concise History of Science in India by Majumdar R.C.*: 222. Indian National Science Academy, New Delhi.
5. Buddhadasa, R., Ed. 1960. *Carakasamhita, Su. 1.7-9*, 1<sup>st</sup> Edi: 2.Department of State Languages, Colombo.
6. Buddhadasa, R., Ed. 1962. *Susrutasamhita, Su. 1.11-12*, 1<sup>st</sup> Edi: 2.Department of State Languages, Colombo.

7. Dikshit G S, 1970. *The Siva Tattva Ratnakara as a source for sciences in ancient and Medieval India*, IJHS 1: 2-11.
8. Dodwell. H T, *The Cambridge Shorter History of India (Singhala Translation)*, Department of Educational Publication, Colombo
9. Gunewardena I P., 1999. *History of Medicine*, Surendra Prakashana, Ganemulla,
10. Hall, T.S., 1969. *Studies in the history of General Physiology 600 B.C. to 1900 A.D.* In: Ideas of Life and Matter Vol I. 102-169. University of Chicago.
11. Jadavji Trikamji Acarya Edi, 1994. *Carakasamhita, Su. 1. 20*, 4<sup>th</sup> Edi, Chaukhambha Sanskrit Bhavan, Varanasi.
12. Jadavji Trikamji Acarya Edi, 1994. *Susrutasamhita, Su. 14.11* 4<sup>th</sup> Edi, Chaukhambha Sanskrit Bhavan, Varanasi.
13. Journal of Royal Asiatic Society, 1909, p726.
14. Julius Jolly, 1994. *Indian Medicine (Translated to English from German by Kashikar, C.G.)* 3<sup>rd</sup> Edi. MMPP Ltd.
15. Jurgan, T., 1963. *Science and Secret of Early Medicine*, New York: 169.
16. Lewis, P. Ed. 1996. *History of medicine*. Reeds International Books Ltd., London.
17. Majumdar, G.P., 1927. *Vanaspati*: 160, University of Calcutta.
18. Mukhopadhyaya G., 1974. *The History of Indian Medicine Part III* 2<sup>nd</sup> Edition, Oriental Book reprint Corporation, New Delhi.
19. Oner, C., 1990. *Curare in the treatment of tetanus. Cahno Anesthesiologie* (English Traslation) 38(5): 355-359.
20. Owsei, T. eds , 1987. *The Professional ethics of the Greek physician*. In: Ancient Medicine, Part III: 319-348, Ludwig Edelstein (Tr. By Temkin, C.L.). The John Hopkins University Press, Baltemore and London.
21. Owsei, T., ed. 1987. *The genuine works of Hippocrates*. In: Ancient Medicine, Part I: 133- 144, Ludwig Edelstein (Tr. By Temkin, C.L.). The John Hopkins University Press, Baltemore and London.
22. Perrin C, Noly V, Mourer R, Schmitt D, 1994. *Preservation of cutaneous structures of Egyptian Mummies*. An ultra structural study. Annals of Dermatology and Venerology 121 (6-7): 470-475
23. Radiological Society of North America, Ed., 1989. *The Technical History of Radiology*. Radiographics 9(6): 1095-1283.
24. Reinhard K.J., 1990. *Archaeoparasitology in North America*. American Journal of Physical Anthropology 82(2): 145-163)
25. Rev. K D Kalyanawansa, 1971. *Historical Atlas of India (Singhala)*, M D Gunasena co. Ltd. Colombo.
26. Sameh M. Arab, 1998-2000. *Medicine in ancient Egypt Part I* - Electronic version, © Arab World Book, 1998-2000
27. Scoville, W.B., 1973. *World Neurosurgery. a personal history of a surgical speciality*. International Surgery 58 (8): 526-535.
28. Sharma, P. V., 1981. *Ayurveda ka Vajjanika Itihasa – (Scientific History of Ayurveda)*. Chaukhambha Orientalia, Varanasi.
29. Sheila Savill, 1977. *The Ancient Near and Middle East – Pears Encyclopaedia of Myths and Legends*, Book Club Associates. London
30. Subba Reddy D V., *A short note on Medicine and allied subjects in Siva Tattva Ratnakara by Basavaraja*, IJHM 5.2.37
31. Suddick R P, Harris N O, 1990. *Historical Perspectives of oral biology*: Critical Reviews in Oral Biology and Medicine 1(2): 135-151
32. Wijerama, E.M., 1947. *Historical Background of Medicine in Ceylon*. J Ceyl Bran BMA 43: 1-16.
33. Winternitz. *A history of Indian Literature, Vol I Part I: 271*. In Sharma, P.V., 1981. *Ayurveda ka Vajjanika Itihasa ( Scientific History of Ayurveda)* 2<sup>nd</sup> Edi: 100. Chaukamba Orientalia, Varanasi.
34. Withington E T., 1894. *Medical History from the earliest times*: Scientific Press Ltd, London.