MEDICINE AND ITS PRACTICE IN ANCIENT INDIA (Upto 3rd Cent. AD.)

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CERTIFICATE

Certified that the dissertation entitled "Medicine and its Practice in India, upto 3rd Century AD." submitted by Kanjiv Lochan in fulfilment of six credits out of the total requirements of twenty-four credits for the award of the degree of Master of Philosophy of this University, is his original work and may be placed before the examiners for evaluation. This dissertation has not been submitted for the award of any other degree of this University or of any other University.

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Dedicated

to

The drops of tears which I beheld in the innocent eyes of a kid, lying unattended in a basket near the construction - work on the new building of our School of Social Sciences where his mother worked tirelessly for bread.

C O N T E N T S

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PREFACE

Medicine and its practice in India is a most fascinating branch of historical study, second to none in interest and importance. The books on this subject are indeed many. But as indicated in our introductory chapter, many facets of it need to be subjected to further explorations. With the hope and confidence imposed on me, particularly by my teachers Prof. Banerji and Mrs. Qadeer, I have assumed the task to present an outline of such facets of ancient Indian history.

The aim of this dissertation has been to present in a very concise way a history of the chronological development of medicine in India upto 3rd century AD. Attempt has also been made to reveal the picture of the general health status of the people in past. For information, I have mainly relied on the ancient Indian books, reports of ancient travellers and inscriptions. The data thus collated have been corroborated by the works of scholars in general ancient Indian history.

It is very difficult to believe that this dissertation would have attained its present form but for the valuable suggestions so kindly extended by my supervisors, Dr. R. Nayar and Dr. Rajan Gurukkal at all stages of its preparation. I express my profound gratitude to them for not only supervising the present work but nourishing the whole idea right from its synopsis stage to its last finishes.

The student takes pleasure also in acknowledging gratefully the efforts of all those great savants whose works in any shape or form have been utilised in this dissertation. A great influence on the present work is also of my elder brothers, Rajiva, Sajiva, Chiranjiva and Amarjiva who kindled academic interest in me in early childhood and who even today continue to guide me on many vital fronts. I also acknowledge the help of my friends in the hostel, namely Bipin, Ganesh, Phira, S. Asraf, Saadi, Sanjay, Sunil, and Suresh. My friends Mr. & Mrs. Muralidharan deserve high credit for typing.

Nevertheless, the faults and errors in this work are entirely my creations. In fact, I fear to present my clumsy write-up to the world of learned. I can only hope that the scholars, more able and less hampered than myself will take a patronizing approach towards the issues and problems which I have ventured to raise and explain.

NEW DELHI
12 August 1990

KANJIV LOCHAN

Gupta-age Buddha: An ideal body shape

CHAPTER - I

Ancient Indian Medical Historiography: Trends and Challenges

The medical arts and their practice have played so important a part in the development of our civilization that they constitute a branch of historical studies second to none in utility and interest. The domain of ancient Indian medical history has attracted a grand number of studies. Put together they outnumber the combined quantity of studies made in the history of other sciences in India. Inspite of that the field of medical history of ancient India continues in a desideratum.

The poor standard of ancient Indian medical history is partly due to the dearth of sources in the domain. India lacks the kind of historical records of medical systems and prescriptions unearthed in Assyrian sites (Steinmann 1990 : 32). In case of Egypt, there is also a multiplicity of survived original papyri works, numerous wood and other engravings demonstrating various medical scenes. Here as well as in further west, we find remains of skeletons preserved safe thanks to the dry climate. Such remains facilitate investigation of possible diseases leading to death or cases of operated surgery. With the sole help of such remains marvellous works have been done on Egypt (Ghalioungui 1963) and connected regions (Manchester 1984). This method of investigation has come to be called palaeopathology. In fact the archaeologists in west have also developed a branch of investigation of dental disorder in respect of skeletons unearthed, this branch being called palaeostomatology (Brothwell and Sandison 1967 : 673).

One of the reasons of the poor medical historiography of ancient Indian medicine is the fact that this field has so far been

prominently dominated by scholars basically belonging either to medical science or to philosophy. The lack of proper training in the field of history is reflected in indiscriminate selection of subjects and undue emphasis on certain issues.

The modern notices on Indian medicine start appearing from the early 19th centruy. Dr. Ainslie, a surgeon in Madras, published his Materia Medica of Hindustan in 1813. He was followed by Wise who produced his scientific narrative on Hindu System of Medicine in 1845. These works discussed the medicinal items, anatomy and physiology of Ayurveda.

These early scholars were followed by the western philologists interested in Sanskrit. But apart from discussing the content of ancient Ayurvedic texts, such philologists as Weber (1878), Macdonell (1899) or Keith (1920) also debated and fixed the date of these texts.

Early scholarship of ancient Indian medicine was also greatly stimulated by the discovery of a certain 55 burch leaves by Lt. H.Bower near Kashgar in Central Asia. A number of scholars attempted to edit and study this text, named Navanitakam but famous as Bower Manuscript (presently kept in Bodlein Library, Oxford). The trend setter among such attempts was that of Hoernle (1893 and 1909) who edited two volumes on this ancient medical book.

Such introductory works on ancient Indian medicine hinted the apparent resemblance between ancient Greek and Indian medicines. Partly due to this and partly because of the general trends of Indian historiography, the later works on ancient Indian medicine were coloured in two different tints. One group of scholars demonstrated European bias while the other group was strongly nationalistic.

The European prejudice is betrayed in such points as unwarrented stress on advocacy of the so called role of the ancient Greece in the introduction of the science aspect of medicine. An example of this we might cite, is the apocryphal opinion of Johann Hermann Bass that the name of Sushruta was in reality a transmutation of Socrates and that his birth place of Kasi was a mutation of Kos (ref. to JHM & AS. Oct. 1970 : 492). The Greek origin of Ayurvedic science was a favourite subject of such deliberations, scholars like Albutt (1909 : 1) was also involved in announcing that the medicine of India did not contain even the rudiments of science. The European bias in historiography of ancient Indian medicine is reflected also in newer write-ups. For example Krumbhaar (1947 : 84-97) would say that medicine in ancient India was 'different from Greek and was in primitive state'.

The bias is also demonstrated in a score of writings dealing with world history of medicine which never or seldom bother to mention the medicine of ancient India. There are a host of such prejudiced works in the history of public health (Rosen 1958), psychiatry

(Schneck 1960), preventive medicine (Wain 1970) and general history of medicine (Metter 1947, Ashworth 1953, Guthrie 1960, Singer and Underwood 1962, Hobson 1963).

But certainly this pattern has not been uniformly followed by all western scholars active in this field. Though not copiously, certain scholars have indeed included a narrative of ancient Indian medical systems. In fact, some of such works have provided us useful materials on ancient India in connection with history of medical education (Puschmann 1891), healing gods of antiquity (Jayne 1925), history of surgery (Zimmermann and Veith 1961), science and secrets of early medicine (Thorwald 1962) and also about ancient diseases caused by bacteria and virus (Hare 1967). (It is however, strange that Hare has dated the ancient Indian text Manusmriti in 1300 BC : 126). Besides, some other works on world history of medicine deal Indian situations. These works include both old and new studies like those of Baas (1889), Garrison (1929) and Major (1954).

For the orientalists medicine in ancient India offered a strong chance to magnify the ancient glory of India. Mr. Colebrooke declared that in the field of medicine, 'the Hindus were teachers and not learners'. Similarly Mr. Pocock was of the opinion that Pythogorus 'father of healing art' in Greece - was originally an Indian called Buddhaguru. Prof. Diaz opined that Egyptian medicine was of Hindu origin.* Prof. Filliozat (1949) also belonged to this category. Through

* For further note of orientalists' views, see Sinha Jee (1895:192).

an independant work on ancient Indian medicine, he tried to prove that Ayurveda was of Vedic origin. Besides this his work also involved narrative of the fundamentals of Ayurveda as well as a discussion on the Greek parallels of Indian medicine.

Apart from the foreign orientalists there was a group of nationalist scholars in this field. They were concerned not only with countering of the theory of Greek Origin of the Ayurveda but also maintained that the decline of Ayurveda' in the country was on account of discouragement by the imperial power which supported only the Allopathic system of medicine. Sinha Jee, leeader of such scholars, argued for the Aryan origin of Greek medicine and opined that Hypocretes, the ancient Greek medical theorist himself had to come to India to learn medicine (1895:190). He suggested that, if the medical sciences of India in its palmy days, had directly or indirectly assisted the early growth of medical science in Europe, it was but fair that the latter would show its gratitude by rendering all possible help to the former, old as it was, and almost dying for want of nourishment. In the opinion of this scholar Aryan medicine declined as a result of the unfavourable policies of Mughal emperors (p.198).

To establish Ayurveda as a science of high scope and utility, numerous monographs were prepared by nationalist scholars who highlighted the standard of Ayurvedic pathology, diagnosis, prognosis, materia medica, therapeutics, gynaecology, obstetrics, paediatrics etc. etc. Some representative works among them are those of Gupta (1901), Mukhopadhyaya (1923), Chakrberty (1923), and Sharma (1929). As a rule

these monographs are vastly crowded with quotations from the Sanskrit texts of the Ayurveda. After independence independant works eulogizing ancient Indian medicine are rather rare but nationalist accounts of it continue to appear in works on the history of general sciences like those of Seal (1958), or Mehta (1959). A similar study has tried to deny or minimise the Hellenistic credit to the growth of sciences in India (Banerji 1961).

Apart from praising the high scientific standard of the Ayurveda, the nationalist accounts of ancient Indian medicine also contain narratives of mythological figures like Dhanvantari, Indra, Ashvini or Bhardvaja, Chayavana and Kashyapa or others. The historicity of such figures has hardly been discussed in the above studies. This is the case also with a few independant monographs on medical authorities of ancient India by scholars like Jaggi (1966) and Shastri (1977).

These nationalist accounts failed to impress other group of historians, and as late as in 1962 we discover Kutumbiah, a physician by profession, producing his Ancient Indian Medicine for the purpose of bringing 'knowledge of the achievements of ancient Indian medicine to a much wider reading public' - and establishing its legitimate place in history'. Nevertheless, the historiography of ancient Indian medicine remains indebted to the above studies, particularly for the materials they offer on Ayurvedic authorities and the details regarding the scientific aspects of Ayurveda.

In the available literature on ancient Indian medical historiography, books on their scientific aspects number the most. Mention must be made first to the Banaras Hindu University series on 'Surgery in ancient India' by Singhal and his friends (1972 onwards). Based on the ancient Ayurvedic text, Sushruta Samhita, the series displays true Sanskrit scholarship and sound surgical knowledge which were lacking in previous works on the theme. Another work on the Sushruta Samhita has been authored jointly by Ray, Gupta & Roy (1980). Historiographically this work is more helpful since it mentions the diseases referred to in the above ancient text and discusses its date. Same group excepting Roy has also produced a similarly useful work on the ancient Charaka Samhita (1965).

Another series dealing with the ancient Indian medicine has been prepared by Jaggi. Basically a chest-specialist from Delhi, he has produced many a work on other sciences in Indian history also. Though his works Yogic and Tantric medicine (1973a) and Folk medicine (1973b) are valuable since they cover new subjects, his Indian System of Medicine (1973) reflects a poor scholarship. It describes in some detail the medical education, personal health, anatomy, physiology as well as classification, diagnosis and prognosis of diseases in the Ayurveda. The same approach has been used several times already in past. It is hardly enough to serve up verbatim extracts from the ancient Ayurvedic texts, without adding onto any material respecting the problem of chronology of these medical treatises. The major fault of this volume is that it has nothing new to say. It is meant more for a widely-read amateur and hence lacks original efforts which are much wanted in this area of academics.

Among the books limited to the scientific narrative of Ayurveda without any discussion on its relations with the history of the country in general, may be noted the monographs of Hoernle (1907) concerned with osteology in ancient India, Gupta (1930) concerned with the general principles of Ayurveda, and Udupa (1970) concerned with drug evaluation in India as well as Sushruta's contribution to the fundamentals of surgery. Recently Bose (1971) has edited a work on the history of sciences in India. In this book, Prof. R.C. Majumdar authored the portion on Indian medicine (pp.213-266). He referred to the origins and antiquity of Ayurveda but his treatment of the subject as well as the ideas about the basics of Ayurveda are comparable to those of Kutumbiah's work referred to above. Another series of ten essays on medical science and physiological concepts in ancient and medieval India have been edited in 1974 by Keswani. These works are also of not much help in understanding the state of diseases and health in ancient India.

In the category of scientific narratives of Ayurveda, a recent publication of Zimmermann (1987) may also be noted. The core of his monograph, chapters four through eight, analyzes the classifications of animals and animal products used as medicine and prescribed in the ancient texts of Charaka, Sushruta and Vagbhatta.

Likewise, articles in periodicals like Indian Journal of History of Sciences, Indian Journal of History of Medicine, or Bulletin of Indian Institute of History of Medicine or other Indian and foreign periodicals are predominantly concerned with the scientific aspects of ancient Indian medicine and fail to enlighten us about the general picture of health and cure in ancient India. As Kumar (1985:158) informs

us, even the earliest journals of ancient Indian medicine were devoted solely to materia medica, pathology, treatment, preparation of drugs, dietics etc. It is not only strange but unfortunate to discover that studies on the historical significance of medicine and its practice are exceedingly rare. In place of dealing upon the history of medicine these periodicals seem to trade rather in the medicine of history. This is amply illustrated by such articles on topics like methods of sterilization in the Atharvaveda (Roy 1966); anatomy in Vedic literature (Roy 1967); methods of contraception in ancient India (Dash and Basu 1968); Charaka and Sushruta on sleep (Chattopadhyaya 1969); digestion and metabolism in Ayurveda (Nath 1969); mental health (Verma 1974); Ayurvedic concept of psychosomatic basis of health and disease (Singh and Sinha 1976); emergency medicine in ancient India (Singh and Bajpai 1980); and methodology of science in Charaka (Shekhavat 1984). Unfortunately even in the proceedings of Indian History Congress volumes where articles on medical history are rare, we find papers on the same theme. For example, in one volume, Mitra mentions references to the eight parts of Ayurveda (1968). The position of Hindi journals on the history of medicine is also not different.*

Among the works prepared on the south Indian system of Siddha and other medicines also the monopoly of science-oriented studies continued unabated. Two such works on Yogic and Tantric systems and folk medicine have already been referred to above (Jaggi: 1973(a); 1973(b)). Of these the former only presents scientific introduction of these systems without discussing historical development of Yoga in India. The latter

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* However, it is useful to consult the recent issues of BIHM which regularly publishes abstracts of medico-historical articles in Hindi Journals.

is essentially a work of anthropology interesting enough in content, but again with emphasis on only facts and figures with neither methodology nor direction. Similar is the approach of D.Varaj (1972) who authored a short book on Kerala Pancha Karma medicine. Neelvathi (1979) narrates the Siddha system in the same fashion but adds a mention of the medical authorities of this system. Historical examination of Siddhha theorists is presented neither in this paper nor in the independent book on this theme by Iyer (1933). This has been however, briefly discussed in the papers by Gurusironmani (1983) and Krishnamurthy and Mouli (1984). Another paper by Ganapathiraman (1980) is confined only to the fundamental diagnostic methods in Siddha system. Coming back to the folk system, reference must be made to two successful papers of Bodding (1925) who studied Santhal medicine; and Hemalatha and Reddy (1982) who worked on folk medicine in Andhra Pradesh. Combined together these works offer valuable insights into the non-Ayurvedic side of ancient medical history.

Among other subjects studied in the field of ancient Indian medicine, philosophy appears to be the most popular. Stress on the philosophical aspect of Indian medicine was but a natural outcome of the notion of otherwordliness of ancient Indians developed as a stereotype by conventional historiography (Thapar 1972:19). Since material growth of Indian medicine appeared incompatible with the alleged other-wordliness of ancient Indian social life, attempts were made to explain their harmonious coexistence (Zimmer 1948, and others). Some other scholars believe that the two were ever in arms against each other (Chattopadhyayay 1977 in particular and Gupta 1954 in general). On the other hand, European scholars, patron of the theory of inter relationship of Greek medicine with Ionian Epicrean and Platonic

philosophies, convinced themselves that the philosophy of Samkhya and Vaisheshika initiated rationalism in Indian medicine. The nationalist scholars supported this view. Therefore the supposedly essential nexus between Samkhya-Vaisheshika philosophy and progress of medicine remained an unchallenged and a seriously discussed issue in all sorts of historiographical works on ancient Indian medicine. Most of these works devote considerable attention to this discussion, which is also the case with the majority of other works noted below. Here we would mention only two recent books dealing with this subject independently. The first is authored by Kushvaha (1986) on the relationship between Samkhya philosophy and Ayurveda. The other is a monograph of Tripathi (1987) on the Nyaya philosophy and Charaka. The major drawback of such a discussion lies in the matter that it hardly bothers to examine the practice of medicine through a behavioural approach. Instead, it overexaggerates the debt of the Nyaya-Vaisheshika philosophy on Ayurveda.

The religious aspect of the practice of ancient Indian medicine also constituted a popular theme in the historiography. Since Ayurveda itself was projected as a science of divine character many nationalist and other scholars do not seem much enthusiastic to author independent works on it. The most notable works in this field are all those penned by western scholars. Jayne's article (1925) on the healing gods has already been referred to above. He has taken a painstaking effort to take accounts not only of such medical deities as Ashvins or Dhanvantari but also of those supposedly functioning as healer deities like Aditya,

Brahma, Indra and Varuna or Vayu among others.* A comparatively very new paper by Zysk (1989) is also of significant value in understanding mantras in Ayurveda. Similar is the paper of Rose (1987) who has discussed the magic squares in Ayurvedic system. A paper on Dhanvantari in Indian literature by an Indian author may also be mentioned (Rao 1972) here.

The extent historiography of ancient Indian medicine also contains some works which may safely be judged as 'compartmentalistic' studies. Methodologically such works remained confined mainly to the compilation of scientific materials of Ayurveda available in different sources. Nonetheless, their contribution to historiography is significant as they not only did study the Ayurvedic texts but also a variety of other literature.

Among the compartmentalistic studies mention should also be made to the book of Joshi (1973) on medicine in the epic Ramayana, and a small paper by Jain (1978) who dwelt upon medical references in the Ashtadhyayi, a grammar-book of 5th century BC. Both of these works offer useful materials. The study of Bhatanagar (1984) on what he considers as Jain Ayurveda also belongs to compartmentalistic historiography. As we have noted below, historically it is curious to style medical science as Jain or Buddhist. But this work however, collects useful materials from Agam literature and other texts. This book also contains valuable

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* It is, however, strange that at two places in pages 152 and 164, his book refers to 'Yajurveda' where the word 'Ayurveda' should have been printed.

narrative of different medical practitioners and theorists who professed Jain religion. Mention here may also be made to the report of Jain (1978) on the medical texts authored by Jain writers.

Mention must be made first and foremost, to Reddy who adopted a social and historical approach contrary to the conventional scientists' approach aiming at the compilation of mere scientific data. It is amply evident from his able studies on health and medicine during the Buddhist times (1962) and the Mauryan Age (1966). The former is largely based on the Ceylonese chronicles Dipavamsa and Mahavamsa while the latter relies chiefly on the Arthasastra. But both the monographs are very small. Another article by Reddy (1978) on Ayurvedic material in the Divyavadana, another Buddhist text is, however, not a very remarkable one of social history perspective.

Though recently Mitra (1985) has also produced an independent, large book on Ayurvedic material in Buddhist literature, he could not go much further beyond the domain already covered by Reddy in the field. In fact, the work is no less concerned with non-Buddhist literature. This is the case also ith the small jacket of Halder (1977), who intended to report on medical science in Pali literature. The approach of both these works is scientific. While Mitra arranges Ayurvedic materials under the traditional eight parts of Ayurveda, Haldar's small book seems to be more interested in such subjects as medicine and surgery in Pali literature, method of abortion and so on. Mitra's interest in scientific aspect of ancient Indian medicine is also evident

from his paper on the Pancha-Mahabhuta and tridosha as depicted in the Buddhist Tripitakas (1978). It may also be, however, noted that there was no Buddhist medicine as such and it would never be advisable to divide Indian medical history into such compartments as Buddhist-age etc.

Mitra's another paper jointly prepared with Gupta (1967) on military medicine in ancient India is also a sketchy write-up but covers a useful topic in historiography. Mitra's small monograph (66 pages) on history of medicine from Pre-Mauryan to Kushana period (1974) is another work of average standard. Strangely enough, it does not bother to discuss how this particular phase of history stands as a variable in growth of history of medicine in India - which is so relevant a topic for this period. Another chronological presentation of the history of medicine is related to the Gupta period. Authored by Sharma (1972) this work is also confined to the scientific aspect of the Ayurveda. But it reflects a high-standard analysis of the literature of the Gupta age. One is particularly impressed by Sharma's painstaking endeavour to discover references to as many as 429 drugs in different Puranas and in the works by Kalidasa. In Ayurvedic materia medica the author seems to be quite at home as is evident also from his another work on this subject published in 1956.

As regards studies on situation of ancient Indian medicine in world setting, its relationship with Greece has been studied elaborately as already noted. Relation of ancient Indian medicine with China, Tibet, Mesopotamia or Egypt has attracted very less number of scholars. Particularly in connection with Mesopotamia and Egypt, studies are but rare. Reference may be made to an early paper by Filliozat (ref.1981)

on Ayurveda and foreign contacts. Kutumbiah, the famous author of the Ancient Indian Medicine, has also taken note of relationship between ancient Chinese and Indian views on longevity (1966). Two good papers by Mahdihassan also cover useful topics on Triphala and its Arabic and Chinese synonyms (1978), and on Tridosha doctrine and the constituents of Chinese humorology (1984). The most successful paper on the historical relationship between the Indian and the Chinese medicine is, however, that penned by Unschuld (1979). He dwells in length upon how both Buddhism and with it the Indian medicine spread in China with the decline of the Eastern Han dynasty (25-220 AD) (p.334). In comparison to the Chinese medicine, ancient Indian medicine was closer to the Tibetan. Kunzang's monograph (1973) narrates, in brief, how Tibetan kings sent their physicians to learn medicine from India. Similarly, Dash (1976) reports on the contribution of Yoga Shatak, an Indian text of 4th century AD., to the development of the Tibetan medicine and psychiatry. It would have been awfully interesting to read the spread of ancient Indian medicine in the southeast Asian countries politically dominated by rulers of Indian origin in the past. It may be noted that the epigraphic records of Jayavarman VII (1181-1218) testify the establishment of Ayurvedic hospitals in Combodia. Besides there are medical topics in what is famous as ancient Indo-Javanese literature. But historiography of ancient Indian medicine, perhaps still awaits serious independent studies in the field.

The above accounts, however, make it explicitly certain that several generations of scholars have made valuable contributions to the field of ancient Indian medicine. They did most of the spade work, made

sources available, and by looking at medicine through different angles, put across interesting points of view. But their approach to ancient Indian medicine remained uncritical and ahistorical. Medical treatises were read for their contents regardless of the date in which they were composed. It remained artifical by being cut off from the general frame of history. To complete our historical understanding of past, it was necessary not only to report on the achievements of ancient Indian medicine but also to examine its relevance to the masses of the country. In so far as the narrative part of medical science is concerned, writers have looked into all the nooks and corners of the subject but they have made little efforts to explore the extent to which it was in application for the benefit of the masses in general. Therefore, it is surprising and unfortunate to find that studies giving fuller account of social aspect of medicine in ancient India are still awaited. We have only a few studies on this aspect.

In this group probably the greatest name, would be that of Sigerist. His contribution to historiography of medicine can hardly be ever equalled. Numerous papers and books authored by him treat the medicine of past with an intricacy of detail and systematic comprehensions. In his treatment of the medicine of ancient civilizations, Sigerist drew upon the entire range of their literature including those pertaining to religion, magic and administration as well as their purely medical writings and interpreted them with the help of his own unique combination of medical knowledge and experience. Throughout his career, Sigerist aimed at to discuss the medicine from the angle of historical sociology of medicine. This is fully reflected from his paper Sociology of Medicine (1960). His earlier monograph on

civilization and diseases (1945) itself was a work of splendid scholarship of historical sociology. As a champion of historiographical thoughts, he may fairly be judged as E.H. Carr of medical historiography. (The study of Soviet Russia appeared to be a favourite theme to this scholar also and he authored a monograph in 1947 on health and medicine in the USSR. Sigerist is mainly remembered and esteemed for his two volumes (1951 and 1961) which are so indispensable for students working in the field of medical history. Sigerist knew Sanskrit or possibly Hindi too (Veith 1958). The second volume of his monumental study deals with the Vedic medicine of ancient India. Among other topics it takes account of possible diseases in ancient Indian society, various philosophic schools of early India and their relation with Greece in scientific and historical perspectives.

The major shortcomings of this approach include the overemphasis on Indian traditions of other worldliness. At one place the scholar opines that (in case of droughts) an Indian may lie down and die of starvation in front of food-stores (of the opulants) without rebelling (1961 : 134). Similarly, there is excessive stress on the description of Indian philosophies. Unwarranted comparison to Greek medicine and repeated stress on poverty of scientific zeal in ancient Indian society (supposedly due to racial and climatic reasons) are also among the demerits of these volumes which are dedicated to the 'hippocratic tradition in medicine'.

The monograph of Vidyalankar (1976) is a successful work combining general history with the evolution and practice of medicine in India. The treatment of the system of medical studies in ancient India in this book serves as a valuable reading. Almost equally useful is a book by Sharma (1981) on the history of Ayurveda. The short book of Vakil (1966) is another satisfactory study in this direction. It also covers the possible specializations in ancient Indian medical studies. A recent work by Rao (1985) serves a valuable historical perspective of ancient Indian medicine. Mention may also be made to the two small papers by Swamy (1978) and Bagachi (1979), which are chronological studies of the development of ancient Indian medicine. Linking the growth of medicine in India with urbanization is also a valuable issue raised by Nath (1970). A small write-up of Raghunathan (1984) has cast valuable light on the myths and history of Siddha system. In this group of social studies may be included the paper of Murthy (1971) on the refusal of patients for therapy in ancient India, and of Menon and Haberman (1970) on cultural significance of the oath of medical students in ancient India. Perhaps, the most useful paper of social history of medicine in India is that of AL. Basham (1976), the doyen of ancient Indian historical studies. His 39 pages on the practice of medicine in ancient India present a highly readable and able account on a number of topics including medical training and social status of physicians in ancient India.

In the beginning, we have observed that the historiography of medicine in India lags behind the advance made elsewhere. While in the west, the number of scholars not belonging to the discipline of

medical science has grown considerably in last 45 years, the Indian historiography of medicine is still dominated by scholars basically from medical sciences. Historians involved in this field are exceedingly few in number, the two striking exceptions being Majumdar (1971) and Basham (1976).

High standard works have been produced in medical history in respect of other countries. Some of these books may serve as great stimulus to the students interested in the field of ancient Indian medicine and its practice. The most prominent among such book is definitely the voluminous study of Joseph Needham on sciences in China. The recent works of Jackson (1988) on doctors and diseases in the Roman empire, and of Gremek (1989) on diseases in the ancient Greek world also launch a challenge to us for attempting serious study on similar line in the context of ancient India. The western historiography of medicine is broadening its depth through many modern methods as is also reflected through essays of Ibanez (1958) and report of Clarke (1971). The bibliographical accounts of medical history is also progressing there speedily. We are particularly amazed to finger through such collections as the one edited by Corsi and Weindling (1983). Though based on the western background, Corsi's work contains perhaps the largest bibliographical account of ancient Indian medicine.

The challenges involved in the historiography of ancient Indian medicine are, therefore, great and multi-faceted. According to Banerji (1982 : 208) '.... in a community, perception of a health

problem, meaning of the state of health and disease, response to various institutions that exist for dealing with these health problems, all form an integrated, interdependent and interacting whole. It is a sub-cultural complex which can be termed as the health culture of the community. It is ultimately linked with changes in the overall culture that are mediated by various social, economic and political forces'.

Therefore, first and foremost is the need to analyse the social milieu of the growth of medicine in India. The geographical environment as well as the economic settings influencing medical practice in past also remain to be discussed. All these must be done in the light of the analysis of the diseases of ancient India. The interesting question of the average longevity of ancient Indian person also remains unanswered. We are yet to explore the possible size of population in ancient India. The distribution of works and leisures among this population is to be assessed anew. Cultural study of the theory and practice of medicine in India, by and large, awaits serious attention. The role, rights and behaviour of sick persons in society are other interesting terra incognita for researchers. Our knowledge of the system of medical education in ancient India is equally deficient in many particulars. The social and economic status enjoyed by medical practioners of the yore is a subject yet to command sericus attention of the scholars. It would likewise be of immense interest to explore into the general health status of ancient Indian

people and also to review medical care available to different strata of population. Most of these gaps referred to above deserve specialised studies on each of them.

The following pages are meant to draw an outline of the ancient Indian history upto the 3rd century AD. in view of the above challanges to historiography of ancient Indian medicine.

As regards methodology, we have chiefly relied on the perusal of ancient Indian books reflecting the social and medical history of our past. The ancient books consulted are as follows :

Arthashastra

Atharvaveda (major portion)

Bhagavad Gita

Brihadaranyakopanishad

Buddha Charitam (I to XIV Canto)

Chandogyapanishad

Charaka Samhita (major portion)

Jataka Stories

Ishavasyopanishad

Kathopanishad

Kenopanishad

Kumarasambhavam

Mahabharata (Adi Parva only)

Mandukyopanishad

Manu Smriti

Meghdutam

Milinda Panho

Pancha Tantra (Fifth Book only)

Paraskar Grihya Sutram (I Book only)

Pratigyanatak

Raghuvamsam

Ramayana

Ritu Samhar

Shakuntalam

Sushruta Samhita (major portion)

Svapanavasavadattam

Taitiryopanishad

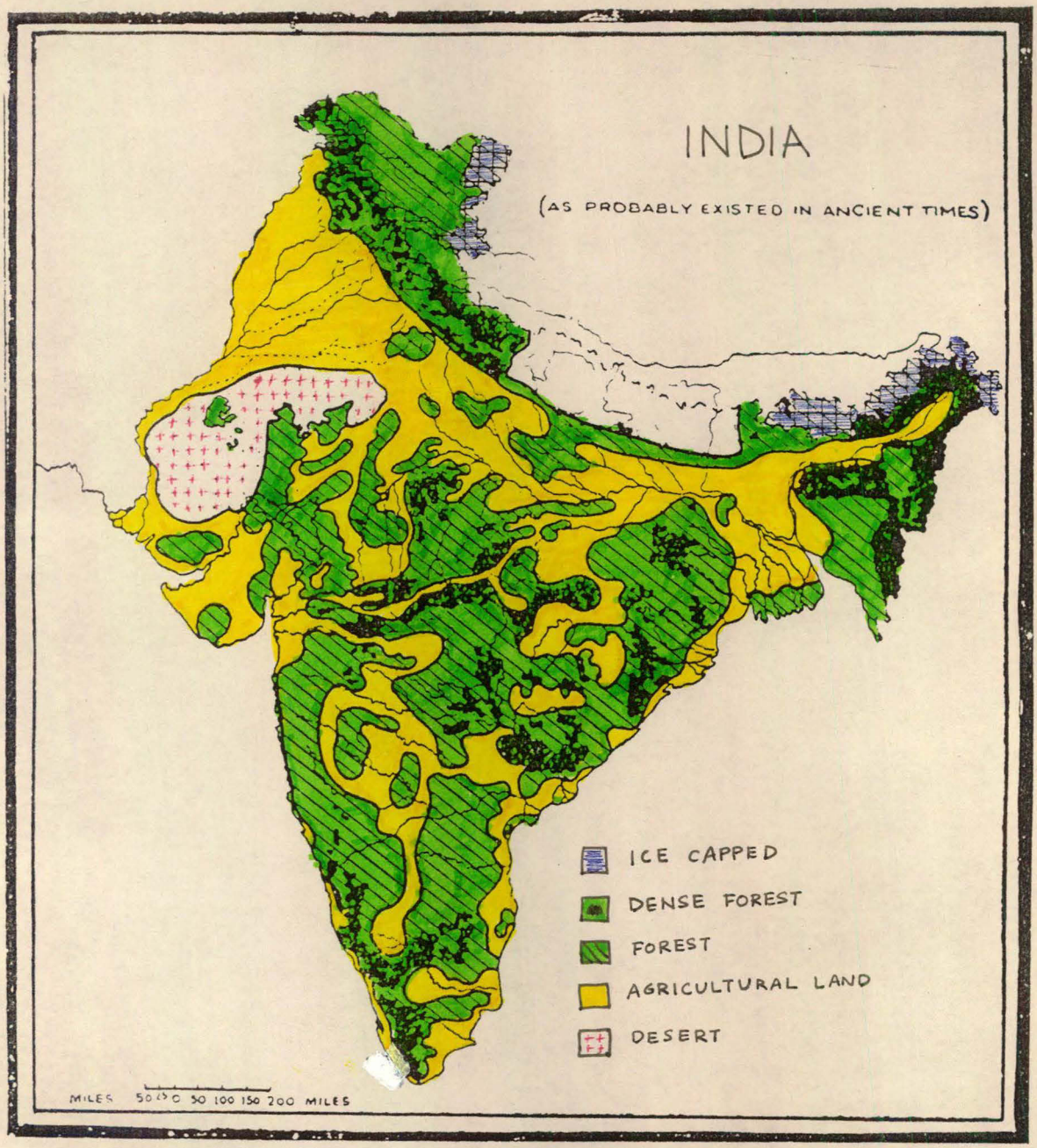
Yogasutra

Yajurveda

These works have frequently been referred in the following chapters and the authenticity of these references is the responsibility of the present student. References from other ancient texts have been utilised here from the works of different scholars. Among such works are also included specialised studies by Agrawala (1969) on Ashtadhyayi and by Puri (1957) on Mahabhashya.

Our study was greatly facilitated through the collection by McCrindle of the reports of the ancient Greek travellers like Magasthenes and Arrian. The present study has also utilized the materials of almost all the major inscriptions available from our period of study. The present student has also taken the benefit of going through standard works of modern scholars on ancient Indian education system, polity, geography and agriculture.

The material thus collected has been analysed in the context of the works available on the social history of ancient India.


INDIA
(AS PROBABLY EXISTED IN ANCIENT TIMES)
ICE CAPPED
DENSE FOREST
FOREST
AGRICULTURAL LAND
DESERT
MILES 50 0 50 100 150 200 MILES

CHAPTER - II

Evolution of ancient Indian medicine

Before we move ahead to explore the historical evolution of ancient Indian medicine, it would be pertinent to analyze the diseases prevalent for which the service of doctors was sought in the antiquity.

Diseases referred to in the Vedic literature are less. But it may be because of the rudimentary stage of the classification of diseases at that time and partly because it is predominantly a religious literature. The number of diseases occurring in the epic Ramayana; Ashtadhyayi of Panini (5th Cent. BC.); Arthashastra of Kautilya (4th Cent. BC.), and the Mahabhashya of Patanjali (2nd Cent. BC.) are about fifty. The 2nd century BC. text Milinda Panho (4.4.16) contains reference to 98 diseases. The classical texts of Ayurveda, however mentions more than one thousand types of illness.

The tuberculosis, which victimises above 1.5 per cent of India's population today (India 1985:148), must have been the chief medical problem in past also. However, the medical text Charaka Samhita (6.8.14) does not take a serious note of it. But our inference is clearly supported by the numerous references to the ailment in non-medical books of the country's past. This deadly ailment perhaps used to claim the largest number of lives as is the case today.

The problems related to the delivery of babies were, however, of greater concern. Diseases of pregnancy and child birth have occupied a considerable portion dealing with ailments in the medical treatises of Charaka (4.8.26) and Sushruta (3.3; 3.10). These diseases are mentioned frequently in ancient works like Atharvaveda (6.8.3) and the Ramayana (1.37.27). In modern days also, the casualties owing to neo-natal and post-natal ailments have largest share in the under five mortality rate of the country. The under five mortality rate is, as per latest information, as high as 11.8 per cent in the country (Anantapadmanabhan 1989: Appendix III). The situation in past must have been grimmer.

The next major ailment was 'Kushtha' leprosy which today plagues as many as fifty seven individuals out of every 10,000 (India 1985:148). References to this disease are in plenty in the variety of ancient texts like the Atharvaveda (1.23.1), Ashtadhyayi (8.3.97), Arthashastra (3.18.4), the Jatakas (Mahakapi Jataka; no. 516; Kunala Jataka;no.536; Bhuridatta Jataka; no.543) and in such law-codes as that of Manu (2nd Cent. AD.) (11.49). The medical text Charaka Samhita (6.7.11-26) narrates many types of leprosy.

Sigerist (1961:128) suggested that malaria probably presented the chief health-problem in India's past. We fail to discover a clear-cut mention of this disease in the ancient texts. But it might have been included among the different classes of fevers narrated in the treatises of Charaka (6.3) and Sushruta (6.39). Similarly Kala Azar, literally 'deadly fever', which constitutes one of the major health

problems today (India 1985:148) is also not specifically mentioned in the early texts. We can only presume that the different types of 'jvaras' included this ailment too. Some of the fevers must have been fatal enough otherwise Bharata the prince of Ayodhya, would not have wished that who ever had caused his brother Rama to go to forest be a prey to 'jvara'. (Ramayana 275.49)

The next major health-problem was snake-bite. Since the forest-coverage of India in the past was much greater than now, and forests more often surrounded habitational areas, the snake-bite was extremely common. This is attested by the countless references to cases of snake-bite in almost every literary text of the olden times.

The other prominent front requiring the aid of physicians was the battle-field. The magnitude of this problem may be gauged from the fact that as many as 150,000 men were supposedly maimed in the battle of Kalinga in the eighth year of Asoka (13th Edict). Amputation of limbs as a punitive measure was also probably a frequent thing in those days. (Manu Smriti 8.269; 8.280). This would have necessitated a fairly good knowledge in the art of surgery and medicine. As the craft of warfare involved the deployment of elephants and horses, the states were interested in maintaining the health of these animals. Perhaps this explains the development of veterinary sciences in ancient India in respect of horses and elephants. Due to the lack of state support the science of curing the illness of popular domestic animals like cow, more useful to the commoners, could not develop at par with the veterinary sciences taking care of horses and elephants. This pattern of health-management persisted on through the more recent British Raj.

According to the latest available data, every 85th Indian is suffering from blindness (India 1985 : 148). The problem of vision was perhaps not of much serious concern in the past because neither the medical texts nor other books refer to this on any significant scale. This is not to suggest that it never occured to contemporary society as an important health problem. The other common ailments of India's past were the 'Vishuchika' (choleraic diarrhoea) (Charaka Samhita 3.2.10, 6.15.51), Galganda (goitre) (ib. 6.12.79),'Antravridhi' (hernia) (ib. 6.12.94), 'Apsmara (epilepsy) (ib. 6.10.3), Arsha) (haemorrhoids) (ib. 6.14.7), Atisara (dysentry) (ib. 6.19.4), Dhanushtambha (tetanus) (ib. 1.20.14), Sannipat (typhoid) (ib. 1.17.41), Madhumeha (diabetes) (ib. 2.4.44), Pandu-roga (jaundice) (ib. 6.16.7), Shankhyambeda (migraine) (ib. 1.20.11), Shlipada (elephantisis) (ib. 6.12.98), Kacchipaka (carbuncle) (ib. 1.17.85), Sarwangaroga (paralysis) (ib. 6.28.29), Vatabalash (rheumatism) (ib. 6.29.11), and cough (ib. 6.18.2).

The classical texts of Ayurveda also refer to certain tumours. Based on their details, some scholars maintain the prevalence of the deadly disease of cancer in ancient India (Mukerji and Chakraberti 1968 : 70). The prevalence of different heart diseases is also known through the passages in the texts of Charaka (1.17.6) and Sushruta (6.43).

As for mental diseases, the Ayurvedic texts have given considerable attention to them. Fifteen types of insanity (Unmada) are described in the Charaka's text (6.9). There are mentions about

certain minor ailments of mind in the text of Sushruta (1.1.19). References to suicides are found in a few ancient texts (Ramayana 6.116.18; 7.40.1; Milinda Panho 4.4.14) (Thakur 1963). However, we have no proof to relate all these instances of suicide to mental illness.

It appears that handicaps like dwarfishness, lameness and so on were considered part of contemporary health problems by Charaka (1.20.11). The ancient Indian society seems to have had several epidemics as the reference in the Arthasastra would have us believe (8.4.6). Similarly regions marked for certain diseases are mentioned by Manu Smriti (4.60). But since all this stands uncorroborated by the medical treatises like the Charaka Samhita (3.3.4), we can hardly be certain about either the epidemics or the epidemic-prone regions of the past.

Besides the above mentioned diseases the physician's service was called upon commonly in those days for several minor ailments like indigestion (Charaka Samhita 6.15.42), headache (ib. 1.20.11), eye-ache (ib. 6.15.42); ear-ache (ib.6.26.127) and tooth-ache (ib. 6.12.78).

We would like to conclude this narration by pointing out that, strangely enough, we fail to discover a reference of small-pox in contemporary medical or non-medical texts of ancient India. There is no term fixed for it in the early Sanskrit language either. Probably

this deadly disease appeared in India only later in the 9th century AD. Ever since then it began to be known as 'Vishphot', blow and more popularly 'Shitala, literally 'the cool-lady' (a female deity).

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Our knowledge of prehistoric health situation in India is meagre and deficient. It goes without saying that any evolved system of medical care is anachronistic at that stage. An idea of the health situation of the stone-age man in India may be formed through the general impression drawn out from the efforts made to know it in the world archaeology. Most of the skeletal remains found in the sites of such antiquity are of healthy adults essentially free of organic diseases at the time of their respective deaths. This might indicate a relatively better health situation in that hoary past. But since very few of the prehistoric skeletons are of human beings who were above fifty at the time of death, it may also be concluded that men and women in primitive ages did not live long enough to fall prey to any of the fatal diseases prevalent in those days (Dubos 1968:100).

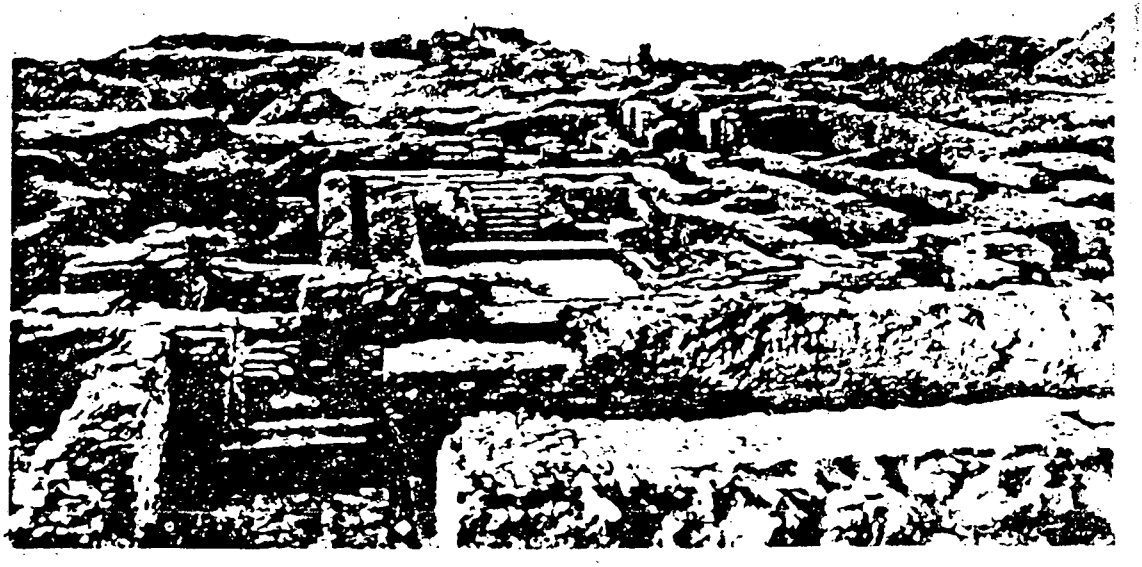
Of the medical practice in palaeolithic and neolithic ages, we are amazed to discover global evidences of trephining. This practice consists of a hole being bored in the skull in order to liberate the evil spirit supposedly housed in a person's head. The discovery by anthropologists of more than one hole in some skulls and lack of signs of osteomyelitis (bone-tissue inflammation) suggest that the operation was

always fatal (Cockerham 1986:3). Excavations of trephined skulls at Burzahom and Kalibangan attest that stone-age Indians too practised gruesome system (Sankalia 1970:63). This operation was probably performed through stone-blades which were used in such cases in East Africa till recently (Brothwell and Sandison 1967:652).

In fact man's fear did not constitute the limit of his psychological reaction. He had a brain which enabled him to go beyond. As soon as he had reached the stage of reasoning, man discovered by the process of trial and error, which plants might be used as foods, which of them were poisonous, and which had some medicinal merit. Thus the struggle against diseases probably had its beginnings in the stone-age itself.

The urban centres of the Harappa culture, which dominated the northwestern part of India for a few centuries from and after 2500 BC., demonstrate a high level of arrangement for public sanitation. In the matter of covered drainage, this culture is unequalled by any of her contemporaries. The famous bath at Mohenjodaro is another evidence of the higher sense of personal hygiene of the Harappans. The remains of residences at Harappan sites are the largest and fairest examples of the building technology of ancient India. The health-consideration in house-building technology was remarkable in the Indus valley civilization. The situation for that matter, was not much different in later periods as well. In contrast to their contemporaries, who used dried bricks, Harappans were in the habit of using baked bricks. Though strong and durable, such bricks devoured a great number of trees to

support kilns which produced them. Probably this along with other reasons possibly led to the desertion of the Harappan regions and the subsequent decline of the civilization.



Great Bath, Mohenjo-daro

Like in many other features of Indian life, the Harappa culture contained also the seeds of much that was characteristic of later Indian medicine. The occurrence of Shilajit (bitumen) as well as arsenic, coral stag and rhinoceros horn at Mohenjodaro (Sankalia 1970:63) leads to the conclusion that those objects which acquired such a reputation as powerful drugs in early historic periods were known for their efficacy since Harappan period. The pieces of Shilajit (a peculiar drug obtained from hills) are kept in the National Museum, New Delhi where are also displayed small large-bellied Harappan pots

with minor holes. It appears that they are medicinal pots about which there is a mention in the epic poem, Ramayana (5.1.23). Mackay has suggested also the discovery of a vast range of copper objects like knives, needles, borers, chisels probably containing surgical value (quoted in Deshpande 1971:13).

The earliest mention of surgery in India is, however, treasured in the Rigveda (1.116.15) which is our prominent source for the life of Aryans, an initially semi-nomadic and pastoral people who later settled as agriculturists in northern India about second millennium BC. With the support of Rigveda and what is termed as later Vedic literature, we may trace the evolution of Indian medicine from the Harappan phase to 7th century BC. Though basically related to the Aryans, this literature traces out also the medical systems of the aboriginal tribes which surrounded them. In fact, the history of the evolution of Indian medicine of this period owes to the harmonious cultural exchange between the Vedic and non-Vedic tribes, which was an ongoing process for many centuries. Finally they succeeded in dismantling many of the cultural barriers between these peoples and giving genesis to a synthetic science of medicine.

Viewed from the perspective of medical progress, the two phases of Vedic age early and later spread over several centuries seem to have witnessed the evolution of a medical system which is largely identifiable as the Vedic practice. Diseases and its treatment remained mostly a subject matter of religion. The traces are available in its literature, as rudimentary attempts to locate and separate scientific issues in the phenomenon of disease and its cure.

In primitive medicine all diseases are essentially connected to certain spirits or demons. Though evidences of a kind of differentiation of diseases are not rare in the Vedic literature, the practice by and large was pantheistic. We also discover instances of identifying diseases on the basis of diagnosis, in the later mandalas of the Rigveda. Among many, references may be made to the naming of the diseases in the Rigveda, such as heart-disease (1.24.8), exanthema (7.1.2), dysentery (10.102.12); and jaundice (1.1.12), and in the Atharvaveda of dropsy (1.10); sores (6.25); tumors (6.57); Fever (1.25). The origin of the later classification of diseases as per Tridosha in the body wind, gall, and mucus , may also be traced back to Vedic period on the basis of certain references in the Atharvaveda. (6.109.3; 6.127.1; 10.2.13).

A passage of the Yajurveda (12.97) clearly refers to the physicians knowing medicinal cure of these diseases. One passage of the Atharvaveda (6.44.2) refers to 'hundreds of medicinal herbs and their thousand allies'. The materia medica of this text contains herbs of recognized medical value which were widely used in later Indian medicine. To count a few of them, they include guggalu (19.38), shatavari (4.4.3), risham (4.4.4), kapith (4.4.5), ajashringi (4.37.2), pipali (5.6.109) and some hair-vitalizers (6.2.13). At one place in Atharvaveda poison is said to be the only remedy against poison (7.88.1). This comment is comparable to a similar note in the Ayurvedic text, Charaka Samhita (6.23.17).

The emerging science in later Vedic medicine is also testified with the coarser speculations of human anatomy in its literature. For example the Yajurveda (12.75) refers to 107 vital limbs of the body; the Shatapatha Brahmana to 360 bones in man (10.5.4.12; 12.3.2.3) and the Kathopanishad to one hundred one arteries springing out from the heart (2.3.16). The knowledge of animal anatomy might have advanced through frequent sacrifices of animals which was a regular feature of the Vedic age (Thapar 1966:45).

Nevertheless, as noted above, the science in later Vedic medicine could not develop as an independent entity and it survived as subsumed by the web of magico-religious practice throughout the centuries between C.1300 - 700 B.C. The subject-matter of the Atharvaveda, which represents the popular side of Vedic India, consists, in most of its 6000 stanzas, spells meant for success in longevity, curing of diseases, satisfaction of love etc. This is also not strange in the case of the so-named Herb-Canto (Oshadhi Sukta) of the Rigveda (10.97) and majority of medical references in the Yajurveda (see particularly its 12th chapter).

Disease in the popular view of the Vedic Indians, was the result of an attack or of possession, direct or indirect by an evil spirit or demon, or due to magical practices or by a curse of an adversary, or due to the evil eye. To them disease was also transferred from one person to other by sorcery. The demons of diseases in Vedic texts are found in indefinite number, and are known as raksas (injurer), atrin (eater), or pisachas (?), and the like. For example mania was a

possession by bhutas, or ghosts; and epilepsy was the result of possession by a dog-demon. Convulsions were due to Grahi, a she-demon (Atharvaveda 2.9.1; 2.10.6; 3.11.1). Jambha, a godling, seized children and caused convulsions and trismus (Kaushika Sutra 32.1.2). Dysentery was a disease-demon (Atharvaveda 3.2.5), a goddess of impurity who was invoked to crush enemies (ib. 9.8.9). Some times diseases like fever and typhoid (Sannipata) were considered as brothers and sisters (ib. 5.22.12).

Charms are mentioned in the Rigveda against diseases (10.52.161; 163) and poisons (10.7.1). The gods were appealed to through the medium of priests who used prayers and mantras, sacrifices, the healing waters, purification by fire, and remedies, intermingling charms, amulets, and the arts of magic and sorcery. Man is released from demons by an amulet of ten kinds of holy wood (Atharvaveda 2.9.1). Demons are slain by amulets (Kaushika Sutra 42.23); sorcery is repelled (ib. 39.1); and triumph is gained over human enemies (ib. 48.3). Gold worn as an amulet confers longevity (Atharvaveda 19.26.1).

The Atharvan materia medica, as noted above, included herbs of definite medical value. Still their efficacy was not depended upon entirely and more emphasis was frequently given on the method of their magical preparation and shamanist administration. Many substances were believed to have possessed magical powers when brought in contact with the patient, by inhalation or fumigation, such as the smoke from burning wood used for expelling demons (Kaushika Sutra 25.23; 31.19) and for killing worms (ib. 27.17.20). Cure of disease is effected by

the laying-on of hands in connection with expelling hymns (ib.26.6, 32.18), and a ring of magic powder is drawn around the house to prevent the return of the demons (ib. 28.11). Poison is removed from the body by applying ointments downward to the feet believing that poison will do the least harm then and finally be out of the body (Rigveda 10.60.11).

The theology of the so-named Brahmanistic religion had minimum impact on the popular medical practice of the Vedic age. In theory the Brahmanic deities were the benevolent patrons and natural protectors of the mankind. One need not fear a curse of disease from their part if one led a life of purity. Otherwise he or she might be cursed with diseases by such deities as Rudra (Rigveda 1.114.8; 2.33.11), Surya or particularly by Varuna (Atharvaveda 1.25.3, 4.16.7). The function of healing pertained to a number of deities who are mentioned in the Vedic hymns as physicians, but as an incident to their more important duties directing the various forces of nature. They appear as working cures in a detached and sporadic fashion rather than as a matter of devotion to the sick and suffering. The Vedic pantheon did not seem to have developed a divine healer of pre-eminence who devoted himself to the people. Dhanvantari, was the only real divinity of this type, and he was a pale, shadowy personality, practically unknown in most of the Vedic age. The Ashvins were highly skilled, but exercised their healing functions sporadically and were not depended upon by the people. Such was the case with other deities about whose healing powers we get a lot of references from the Vedic literature, for instance, of Indra (Atharvaveda 5.23.1); Varuna (ib. 7.133), Surya (ib.6.133.1; 7.107; Rigveda 10.37.4); Brahma (Rigveda 2.7.16); Agni (ib. 5.29.1) and

Brihaspati (ib. 1.18.2; Atharvaveda 7.56.5). Sarasvati has been mentioned as a nurse in the Yajurveda (19.12).

The majority of the Aryan and non-Aryan tribes, however, placed greater reliance on their tribal or village deities who were in close touch with their daily interests. They retained their traditional, primitive animistic beliefs. The fear of evil spirits oppressed them and overshadowed their respect to and confidence in the gods, whom they regarded as indifferent to the calamities brought upon them by the 'non-gods' or 'demons'. Numerous instances from the Vedas and connected literature demonstrate that such people, instead of supplicating the deities, sought to propitiate, appease, and gain favours from the 'non-gods', especially of the asuras, danavas, daityas, and raksas, superhuman beings hostile to the gods and to all the powers of nature. This worship developed into a cult which was widely recognised and practised, quite apart from, and independent of the orthodox religion but occasionally mingled with it. In this system godlings of diseases were worshipped, blood-sacrifices, food, honey, milk, fruits and flower offerings made to propitiate them. The medium excited himself to a frenzy and dancing wildly, proclaimed that the malignant spirit had passed out of the patient and had possessed him or an animal. It was, in great part, a shamanistic cult which has not ceased to command popularity among a considerable chunk of Indian population. The sustained popularity of such cults was so immense that even when considerable progress in rational medicine was achieved, the authors of medical treatises like Charaka Samhita and Sushruta Samhita deemed it profitable to include

passages related to them. All the four chapters in 14th Book of the Arthashastra by Kautilya of 4th cent BC. are devoted to medical measures of doubtless aboriginal genus.

Not only this but other facts also assert how many aboriginal concepts were incorporated into and further elaborated by the Brahmanical system. Though we expect and encourage disagreement in this front, we would like to observe that with all probabilities, the most eminent healing deities Dhanvantari and Ashvins originally belonged to non-Brahmanical stock.

Dhanvantari is not mentioned in the Vedas, and the earliest reference to him appear in a late work Kaushika Sutra (74.6). His sacrifice is also mentioned in the Sutras like Ashvalayana Grhya Sutra (1.2.1; 3.6; 12.7) and Gautama Dharma Sutra (5.10). In epics (Ramayana 1.45.31; Mahabharata 1.18.38) Dhanvantari is shown to rise out of the sea with many desired things, as the result of the churning of the cosmic milk-ocean, holding in his hands a staff and a bowl of Amrita (ambrosia). Reference to him in Ayoghara Jataka (No.510) as well as in an epigraphic find from Mauryan site at Patna (Museum Guide 1971:33) testify his popularity in 3rd-4th century BC. Our conclusion of his aboriginal connection is based partly on his absence in Vedas and partly on the fact that he suffered repeated degradation. From an independent divinity he became an 'avatar' incarnation (Bhagavat Purana 1.3.1; 2.7) and, finally an earthly king and leech who was mortal (Vishnu Purana 4.8). According to a Punjabi legend

Dhanvantari died of a snake bite (Crooke 1968 : 196).

The belonging of Ashvins to the aboriginal Indian antiquity is more certain. Not only they are a lone instance of celestial twins in Hindu pantheon, their parentage is also most doubtful. They are said to be born of none other than the cosmic egg itself (Mahabharata 1.1.34). At one place the sage Kashyapa and his wife Aditi are said to be their parents (Ramayana 3.14.14). Other references make us believe that they were born from the ears of Vishnu (ib. 6.117.8) or Brahma (Vayu Purana 65.57). The most popular version of their birth also underlines their animistic background. It relates that understanding (Samgya), was married to Eternal-Law (Dharma) whose visible from is the sun. Unable to stand before the brightness of her husband she left her shadow near him and taking the shape of a mare (Ashvini), she began to practice austerities. Eternal-Law taking the shape of a horse, searched for understanding and found her, and so were the twins born (Mahabharata 1.66.35, Bhagavat Purana 6.6.40' Vishnu Purana 3.2.7; Agni Purana 273.4). Because their mother had the form of a mare, these twins were called 'the mare's boys' (Ashvini-Kumara). Their non-Brahmanical identity may also be supported by the references in the Shatapatha Brahmana (4.1.5) where they struggle to gain equality with other gods. They are supposed to be the husbands of Sarasvati (Yajurveda 19.14), and fathers of Nakula and Sahadeva the Pandava brothers (Mahabharata 1.63.117). (It is not just a coincidence that Nakula is seen as veteran horse-doctor in the epic (4.11.7). These twins have great love for each other as was the case

between famous brothers Rama and Laksmana (Ramayana 2.8.31). They are very rarely mentioned separately. The epic poem Mahabharata tells that one was named as Nasatya, 'The Truth', while the other was Dasra, 'Destroyer' (1.3.57). Comparison of the handsomeness of the young Buddha to them (Buddha Charitam 7.7), and the references to their temples in the Arthashatra (2.4.17), however, attest that the twins enjoyed considerable popularity and esteem.

The abundant references in the Vedic texts to a myriad of Ayurvedic figures and concepts definitely fortify the postulation that Indian medical science has its origins in the remotest corners of antiquity. Traces of the Tridosha theory, of speculation in anatomy, or of science in pathology in Vedic literature have been already discussed above. The famous Ayurvedic treatises like the Charaka Samhita put great stress on associating themselves with Bhardvaja and Atreya. These sages have also been known as composers of the 5th and 6th Books (Mandalas) respectively of the Rigvedic hymns. This may indicate the reality that the emergence of rational medicine of Ayurveda had direct nexus with the Vedic schools of seers. The account of the teacher-pupil lineages in the Brihadaranyaka Upanishad (2.6.3, 4.6.3) contains apart from Bhardvaja and Atreya, Agnivesh, to whom is attributed the authorship of 79 out of the 120 chapters of the Charaka Samhita. The great regard for the Vedic tradition by the later medical texts is perhaps most promptly evidenced by the declaration of the Sushruta Samhita (1.1.3) that Ayurveda originally formed one of the sub-section of Atharvanaveda.

GROWTH OF INDIAN MEDICINE

The post-7th century B.C. history of India is the history of revolutionary changes and no less than three distinct upheavals during this phase have mapped out things which evolved into classical systems of ancient India. The first was a social revolution connected with the growth of commodity production, trade and merchant capital. In religious field it was reflected in the rise of the "protestant" sects, Buddhism and Jainism. The second revolution was generated by the incursion into northwest India of the Achaemenian Persian and Greco-Macedonian empires. This new interaction brought Indians into close-contacts with other peoples who were also progressing with the help of iron and urbanisation, and were on par in the growth of knowledge and material achievements. The third revolution was a political and imperial one that began in Magadha (Central Bihar) in the middle of the sixty century BC. and which subsequently contributed to the consolidation of the socio-economic and cultural systems of the sub-continent into one. These three revolutions were partly contemporary and to some extent inter-related. This process may be considered as continuing up to the 1st century AD. No wonder, the development of the classical Indian medicine figured in this phase of Indian history. Which of the three resolutions contributed to this development is a question of interesting debate. We would involve ourselves in this discussion a little later. Here, it is topical to analyse the stages of its development.

Most of the literature of this age is basically philosophic and religious, and it is through more worldy texts like the Ramayana and Mahabharata that we can understand and document the historical progress of medicine. Passages in the Ramayana testify that the 5th century BC. Indian scholars had developed their science to a more conscious and practical limit. They had the sophistication to weave a medical spell around the dominant magico-religious system of cure. A physician was now no longer recognised only as a bhisaj i.e. curer, a term predominantly in use earlier; but was accepted as Vaidya the learned one. The earliest reference to this term appears in the Ramayana (2.10.30; 2.100.13). The earliest occurence of the term Ayurveda (the 'Science of life') in this epic (1.45.31) also attests that the physicians of this age were not merely confined to the cure of diseases but were increasingly accepted as great scholars and propounders of new knowledge in medical practice. The later portion of the term is also significantly indicative of their attitude to compare their discipline with the sacred Vedas themselves.

Mention of the term Shalyakrint in the same epic (5.28.6) also serves as evidence that the surgeons had developed a separate craft-group by the epic-period. Considerable success in medical progress is overwhelmingly evidenced also by the status of great respect and reliance enjoyed by the physicians (Ramayana 2.10.30, 2.100.13, 2.100.60). Though reference to the merit of spells or charms is also noted in this epic poem (1.22.13, 2.75.49, 3.29.28), these practices

were frequently blurred by the emerging theory of the Tridosha which is traceable in a number of places in the great poem (1.33.24, 2.56.27, 7.5.8). Influence of the folk system in this medical progress is also identified through the reference to such system as the management of keeping dead body safe by some oil-treatment (2.66.27).

In the later epic, Mahabharata, we discover a more advanced stage of medicine. The traditional eight branches in which classical Ayurveda is divided, were no longer unknown to the epic. It is in this magnificient poem, that we come across the earliest reference to such classification (2.5.80). It seems that scholars who studied Ayurveda were now in plenty (Mahabharata 12.28.44). The characteristics of a healthy person as mentioned in this poem (ib. 14.12.3) are identical with the one described in the medical treatise, Sushruta Samhita (1.15.48). The popular awareness of the Ayurvedic fundamentals in 5th Century BC. is fairly well attested by textual references in the Ashtadhyayi to such terms Vata 'wind' (5.2.129), Pitta 'bile' (5.2.97) and Shaleshma 'cough' (5.2.100). As regards the later ages, many passages of the Arthashastra and the Jatakas fortify the conclusion that the basic ground of the classical Indian system of medicine was well founded by the advent of the Mauryas.

The above medical breakthrough was perhaps achieved under the leadership of certain medical theorists about whose works we know nothing in concrete but references to whom have survived in the classical texts like Charaka Samhita (3.4.3; 3.8.3) and Sushruta

Samhita (1.4.7). The medical treatise unearthed in central Asia also refers to such medical authorities (Saha 1985 : 12). The second century BC. Buddhist text, Milinda Panho (4.7.20) also names more than five such figures who authored their medical treatises in antiquity. Some of the portions of the Charaka Samhita itself belong to the pre-Mauryan period. This inference is based on a number of reasons. First, Agnivesha, who is by common consent regarded as the original authour of most of the Charaka Samhita* is known as a famous seer in Brihadaranyaka Upanished (2.6.3; 4.6.3) and in the grammer of Panini (2.4.68; 4.1.71) who belonged to pre-Mauryan period. The places associated with various discourses as narrated in the Charaka Samhita are also the familiar seats of Upanishadic conferences such as Panchala or Kampilya (3.3.3). This text also contains references to contemporary republic states (1.8.26) in India. The prose style of the treatise also resembles that of the Brahmanas of Vedas, supposedly composed during 6th-5th century BC. Another style of starting chapters as 'thus spoke Lord Atreya' is also close to the Upanishadic diction.

As regards the present form of the Charaka Samhita, or for that matter, the Sushruta Samhita, it must be recalled that during the political, social upheavals throughout Indian history many of such writing might have been lost or destroyed. Evidences are many to

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* Out of the total 120, 79 chapters of this text end with reference to Agnivesha as this author.

demonstrate efforts made to gather and collate the dispersed documents of both these treatises.

In relation to the Charaka Samhita the most pioneering effort was that of Drdhabala who possibly lived in Kashmir in 4th century AD. (Tripathi 1983:19). The present text of the treatise closes its 79 chapters with a note: 'authored by Agnivesh and edited by Charaka'. Other 41 chapters end with the following addition to this quotation - 'lost and restored by Drdhabala'. The 25th chapter in Therapeutics ends as follows - 'authored by Agnivesh, edited by Charaka and finalised by Drdhabala'. In this quotation the word 'aprapte', lost or unavailable, is not found. All this indicate that the text of the 79 chapters in the portion expounded by Agnivesha and redacted by Charaka; while the remaining 41 chapters form the portion expounded by Agnivesha and restored by Drdhabala in the place of the unavailable portions of Charaka's redaction.

The chequered career of this treatise is reflected also through many a passage pertaining to the Mauryan or post-Mauryan period. For example reference to the terms Jantak (Charaka Samhita 1.14.39);Khuddak (ib.1.9.1; 6.29.15); or Khuddika (ib.4.3) or of the famous Bodhi tree itself (ib.6.29.156) testify that at least some of the portions of the present Charaka Samhita succeeded the expansion of the religion of the Shakya Muni. The editing of this text evidently continued still further since the full swing of the revival of Brahmanical worship of the Sunga period is reflected in this in passages pertaining to the worship of Vasudeva (ib.6.23.93) and of cow and Brahmana (1.1.23; 1.4.31; 1.14.38; 1.8.188; 3.8.11; 4.12.84). (Inclusion of beef among

foods is, however, not an unusual feature of this medical book). This process might have continued in the early Christian centuries as the discussion on fruits in the Charaka Samhita (ib.1.27) includes among others such fruits as peach and apricot, which on the basis of Huein Tsang are known to have been introduced by the Kushanas. It, however, appears that the process of updating the Charaka Text concluded much earlier as it makes no clear mention of any traces of the Puranic theology.

After the analysis of the extant text of the Charaka Samhita, the personal date of Charaka, the 'wanderer' does not remain of primary importance. Charakas as wandering seers or students are mentioned in the early literature such as the Brihadaranyaka Upanishad (3.3.1); Ashtadhyayi of Panini (5.1.14) or the Jatakas (Sonak Jataka); or in later Puranas (Vayu Purana 43.23). Some of such teachers or students might have been involved in the development of the medical treatise, and as is the case with the Hippocratic text, we do not know for certain how many authors with similar names were engaged in the authorship of the Charaka Samhita. Nevertheless, the name of the treatise overwhelmingly demonstrates that, among the host of imitators, there was, indeed, one outstanding theorist, one genius who selected, refined and embellished the material gained from the countless sources available and bound them together to produce the masterpiece of ancient Indian medicine. This Charaka, perhaps known to the ancient Europe as Xarcha (Banerjee 1961:177), is also identified as Tehe lo kia (Levi 1903:382) described in the Chinese translation of Tripitakas as a court-physician of Kanishka. The date

of this Kanishka itself is yet to be settled. But we deem it sound to follow the conclusion of scholars like Basham (1954:498) that one famous Charaka lived in the first century AD.

As the New Testament is to the Old Testament, the Sushruta Samhita is almost one third of the Charaka Samhita in content. But this text is noteworthy for its full treatment of surgery, which is virtually ignored by the Charaka's text. Its language is less archaic, and its treatment is more concise, developed and more systematic. Its late authorship is also attested to by references to the theories of Charaka in it (Sharma 1981 : 74). Notices of the worship of Ram and Krishna in this treatise (Sushruta Samhita 4.30.26) also strengthen this view since they both emerged by common consent as popular deities only after the early Christian centuries. From the present text, at least four stages of the Sushruta Text are in evidence. Besides our Sushruta seers like some other old Sushruta, Chandrata and Nagarjuna are supposed to contribute their mite to the authorship of the treatise. The identity of the last figure is highly debated and attempts have been made to identify him with the famous (medical) theorist described in the accounts of Alberuni (11th Cent. AD.) Itsing (9th Cent. AD) and even Husan Tsang (7th Cent. AD) (Ray, Gupta and Roy 1980:4).

Sushruta has been referred to as son of the famous sage Vishvamitra in this treatise (6.66.4). This view has been supported also by the epic Mahabharata (13.4.54). References to this are present also in the grammar of Panini, (Ashtadhyayi 6.2.37) and

Patanjali (Mahabhashya 7.2.117) who belonged to the Shunga period. All these may help trace the antiquity of the Sushruta school to an early phase. The unearthing of the Bower MSS. however cleared doubts regarding the chronological setting of the famous Ayurvedic treatises. Since the manuscript is composed in the early Gupta script, and as it contains 26 quotations from the Charaka Samhita and 6 from Sushruta Samhita (Clark 1937:352), it becomes clear that these treatises had already become standard works prior to the 4th century AD. i.e. the time of the Guptas.

The above narrative assertively underlines the fact that the process of evolution of Indian classical medicine was complete by the early Christian centuries. This conclusion is reinforced by a discovery from the 1st century AD. site of Sikrap, of certain surgical instruments (Jaggi 1973:173, photo-plate) which might have been used by the pupils of Sushruta.

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The evolution of medicine, therefore was by and large contemporaneous with the age of revolutions noted earlier.

In so far as the impact of the forementioned revolutions on the growth of Indian medicine is concerned, we must acknowledge that these upheavals were so overhauling in nature that every walk of life was but to reel under their influence. But for the Mauryan revolution

Indian medicine would not have attained sub-continental expansion and recognition so quickly. It is however, not an easy task to define the role played by the religious revolution in this regard. The range of the impact of India's newly opened vistas to the Western world is also still a mystery unresolved. In the following passages we have attempted to explore systematically such intriguing questions regarding our ancient past.

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Inspired partly by the phenomenon of flourishing of medicine after what is termed as the 'birth of reason' or 'advent of empiricism' in Hellas during 6th century BC. and partly by the Weberian conclusion that a Protestant ethic was essential for scientific and industrial growth, scholars, particularly the Westerners have tried to knit the emergence of Indian classical medicine with the expansion of Buddhism or other Indian philosopheis of 'Protestant' bent. But an analysis of such ethics goes to discredit or invalidate such theories.

As far as the question of Buddhism is concerned, it may be said that the teachings of the Shakya Muni encouraged an attitude of helpfulness toward the sick but it hardly did foster any pioneering achievements in medicine. Although forming the biggest literature of a single faith in the world, the Buddhist texts do not include a single treatise on medicine. Medical subjects here and there appear but are only scattered in such texts as the Chullavagga, the Jatakas (Nigrodamuga Jataka, no.12); Vishuddhimagga; Milinda Panho and Mahavagga. The sixth chapter of the last text is devoted to a series

of discourses by Buddha on the maintenance of health, prevention of ill-health and cure of diseases. Perhaps, It-sing the 9th century Chinese pilgrim, meant to refer the same 'Khandaka' (chapter) when he observed that the Enlightened one himself preached a sutra on the art of medicine. The Tibetans also believed that the Lord delivered their system of medicine while meditating in the medicinal forest near Gaya (Raghunathan 1984:11). The sage is reported to have been a practising physician for some time (Visvanta Jataka no.69). But it is Jivaka, the personal physician of the emperor Bimbisara and a follower of the Shakya Muni, who stands as the lone Buddhist member in the galaxy of ancient Indian physicians and medical theorists.

The human sufferings from disease seem to have been an important stimulus of the Great Renunciation of the Shakya prince (Buddha Charitam 11.59). However, we should not underestimate the repeated stress of the Buddhistic assertion that life, as we understand and live it, is full of misery and transcending life is real happiness. The Buddhist Four Noble Truths (i.e. the world is full of suffering, suffering is caused by human desires, the renunciation of desire is the path to salvation, and this salvation is possible through the Eight Fold Path) are themselves assimilated with the system pertaining to disease, diagnosis, treatment and liberation from ills (Saundera Nanda 16.41).

Like the brahmanical literature, the Buddhist scriptures also embody references reflecting their faith in charms and spells. The Ramayana (3.29.28) passage of spell against snakes is not strange to the Jatakas (Khandha Vatta Jataka no.203; Padakusalamanava Jataka

no. 432). Similarly the reference to divine herbs in the Ramayana (6.74.31) is equalled by allutions to such herbal plants in the Maha-Ummaga Jataka (no.546). Further the Karma theory of disease in the Manu Smriti (11.49; 12.80) is also paralleled in the passages in Mahakapi Jataka (no.516) or Milinda Panho (4.1.16). The narration of the universal cure of diseases at the time of the birth of Rama, a motif common in many early poems, is echoed in the discription of the birth of the Buddha in Buddha Charitam (1.25), the 1st century AD. biography of the Lord by Ashvaghosha. What more, the Enlightened One himself is reported to be wearing amulet in his childhood (ib.2.21). In one of his famous play, Kalidasa also describes Bharata as wearing such an amulet (Shakuntalam 7.20-21). In Kacchapa Jataka (no.178) a charm to outwit the spirit of Jvara (malaria) is described. to avoid the evil, parents of a Shravasti youth advise him to make a hole in the wall of the house and to escape somewhere. The spirit was supposed to guard the door, but not the parts of the house where there was no outlet. Similarly, a patient of Pandu-roga (jaundice) was supposedly not to be cured by the physicians unless he committed to join the brotherhood after gaining health (Kaya-Vicchinda Jataka, no.293).

As regards the social aspect of practice, it is observed that not all the brother physicians were engaged in practice without charging money (Satadhamma Jataka, no.179).

All these tend to suggest that the cult of Buddhism did not consist anything so special to inspire the birth of rational medicine in that age of revolutions. This inference is also supported by the fact that none of the classical text of Ayurveda pays homage to the Buddhist faith.

However, this is not to underscore the practical rationality of Buddhism which certainly could never have resisted the progress of rational medicine at any rate. Likewise, there is no implication that there were no inquisitive minds in the domain of the Buddhist faith. The passages of the Milinda Panho, 'Questions of Milinda' (i.e. Menander the historical Indo-Greek ruler of 2nd Century BC.) to Nagasena, a great Buddhist seer, supposedly next only to the Enlightened One, are illustrative in this context (4.1.63).

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The conflict between the simultaneously held beliefs in fatalism and in the efficacy of medical interventions posed an interesting dilemma in India's past. To underplay the elements of fatalism in the university popular Brahmanic theory of 'Karma', some scholars argue that Karma does not imply that industry and character will be deprived of their reward (Rajagopalchari 1959:79), or that it is nothing mysterious but simple law of causation (Garg 1978:61). Here may be added a notice of same tone in the Brihadaranyaka Upanishad. In the Bhagawat Gita, which is supposedly the pioneering text of the theory of Karma, diseases are mentioned as caused by certain food intake (Bhagawat Gita 17.9). The popular desire to live upto hundred years,

as reflected in numerous Brahmanic texts (Kathopanishad 1.1.23; Paraskar Grihya Sutra 1.4.13; 1.6.3; Brihadaranyaka Upanishad 6.4.17), also overwhelmingly suggests that Brahmans were not necessarily of other-wordly bent. In the epics also, the most common blessings are those meant for longer life.

But to many of the western scholars the Hindu philosophy turned out to be inward looking and offering no inspiration in the direction of medical progress. Zimmer (1948:179) opined that 'bent on metaphysics, and centered upon the quest for releasing the soul from the bondage of the realm of sense, and suffering through an elaborate technique of introspective experience, Hindu philosophy was inclined to ignore the range of empirical facts in the other world'. The theory of the otherwordliness of the Indians was also valued by Sigerist (1951:170) who even tried to explore geographical reasons for that (Sigerist 1961:122). Such generations were perhaps stimulated also by similar references in the Law-codes like Manu Smriti (5.164; 9.30; 11.49; 12.80) which implied that diseases were due to sin. Indian scholars, interested in undermining such assumptions discovered support in the Nyaya-Vaisheshika school of Indian philosophy which had leanings towards materialism. Seal (1915:63) concluded that the Nyaya philosophy initiated a scientific methodology or applied logic that is found in the Charaka Samhita. Later Kutumbiah (1962:xxi) also confirmed the 'debt' of Nyaya-Vaisheshika philosophy to Indian medicine.

In our opinion searching for the Indian counterparts of the Hellenistic struggle between Ioanian and later Epicurean philosophies

and the Platonic School (Rahman 1977:29), is not historically a task of primary importance. The occidental tradition of severe philosophic rivalry and impatience in lending ear to heterodox views which characterised the adversaries to scholars from Socrates in antiquity to Boris Pasternak in our times, is only rarely echoed in the culture and civilisation of India. Here as Prof. Thapar (1972: 61) observes, "the dichotomies resulting from diverse theories were not forced into confrontation but were mutually adjusted." Aristctle had also tried to popularise his Doctrine of Mean, i.e. middle, but this doctrine remained unpopular and was practically unheard of in comparison to the popularity enjoyed by the similar theory of Middle Path in India.

Besides, while philosophies are usually speculative and theoritical, medicine is a highly practical matter and the physician's task is earthbound. The compiler of the Manu Smriti also seems to have differentiated between them. While a physician is not so favoured the philosophers are included, in his opinion among respectables (Manu Smriti 12.111). As regards the theory of 'Karma', it should not be forgotten that the masses might accept what came their way with religious passivity, but the kings and princes, the rich and the powerful desired health, pleasure and freedom from pain. They welcomed priests and valued their theories, but where religious offerings were of no avail, where oracles and conjurings were ineffective, they did not repudiate the aid of men. Viewed in this light, the emergence of rational medicine may be accepted as the direct consequence of the flourishment in 6th century BC. of the

pleasure-loving middle class people in India. This assumption will be examined into in a moment; here it is essential to review the impact on the Indian medicine of the second revolution, which as we saw usher in due to the contacts with other nationalies.

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During the centuries preceding the rise of Maurya empire, the whole of northwestern India formed a vital part of the international world that stretched from the Indus to the Mediterranean. If the imperial revolution of Magadha in 5th century BC. shattered the isolation of mid-India, the West Asian interlude ended the national isolation of the country and placed its culture within the mainstream of cosmopolitanism and internationalism. That was the legacy of Persia and Hellas, of Darius and Alexander. This international world impinged on every aspect of Indian life - political, economic, cultural and artistic - and enriched it to a deep and significant extent.

The India of antiquity did not limit her international connections with West only. China and countries of Southeast Asia have been no less familiar to our ancestors. But from our point of view, the contact with these countries was definitely preceded by the development of rational medicine in India. The first Indian colonies of noticeable identity in Southeast Asia are traced in Java under the kingship of Devavarma of 2nd century AD. (Majumdar 1963:22). Since the communities there were much less advanced, the Indian culture and of course with it her medicine popularly expanded and finally settled with the liberal inclusion of folk elements in it. As regards, China,

our first major relationship with her dates back to that very period. The spread of Buddhism, and with it the Indian medicine, in China coincided with the decline of the Eastern Han dynasty (25-220 AD.) (Unschuld 1979:334). The expansion of Indian medicine in the land of Confucius was much stinted because by that time the Chinese themselves had evolved their own traditional methods of high medical science which still continue to stand up remarkably well against the competition of modern medicine, not only in China but also in adjoining countries. The popularity of Ayurveda in old Central Asia is, however attested to by the discovery of the Bower manuscript of 4th century AD. from Kashgar.

Coming back to the West, the parallelism in the development of Greek and Indian medicine is striking, both in chronology and in content. There are usual attempts to show that Indian concepts antedated equivalent ones in Greece or vice-versa. Historiographically, it forms part of the general debate on the debt of Hellas on Indian architecture, sculpture, astronomy or other sciences of past. In fact, Greek influence on Indian astrology is undeniable as projected by Clark (1937:350). But we should not ignore the fact that if the ancient Indian astronomers were inspired by the occidental, they did not hesitate to announce the debt by using foreign terms. One of the treatises is called the Romak Siddanta. Even the names of different zoadic signs in the early Indian astrology books like Pitamaha Siddhanta; Surya Siddhanta are just the true copies of their Greek-counterparts. But such instances are absent in the classical Ayurveda. Besides, as Dr. Jaggi narrates 'there are

many fundamental and essential differences between the Greek theory of medicine and the Tridosha. The Indian theory starts with the Panchamahabhut or five basic elements - air, earth, fire, water and ether. But the Greek medical theory stresses on only four elements viz. air, earth, fire and water. Again, in Indian theory the doshas (wind, bile and cough) themselves cannot produce any disease. If they are disordered, they vitiate the dhatus or the constituents of the body and produce diseases in them. In the Greek theory, it is the imbalance of the humors that constitutes disease. Thus it will be seen that while the similarities are superficial, the differences are fundamental between the Greek and Indian medicines' (Jaggi 1973 : 211).

In this context the observation of the ancient Greek traveller Strabo is significant when he says that the Indians make no accurate study of sciences except that of medicine (McCrindle 1901 : 32.79). On the testimony of the Asokan Rock Edict II, we learn that the Mauryan age Indian medicine was superior enough so that the Piyadasi could arrange for two kinds of treatment, of men and animals in the empires of Antiochus and his neighbours in Europe. The amazement which Nearchos, another Greek traveller in the train of Alexander's army noted the skill of Indian healers (McCrindle 1876 : 223) is another sufficient proof to establish that Hellenistic influences on Indian medical progress are virtually non-existent. Here it may be added that Indian herbs were popular in Hellas in such an antiquity as 4th century BC. It is clear through references to Indian herbal

plants by Theophrastus in his History of Plants (Thapar 1966 : 123).

The apparent resemblance between the two classical medicine of antiquity might have been due to the reality that both the Greeks and Indian Aryans sprang from a singular stock of primitive communities. In the early Babylonian civilization also we discover that their medicine was divided into eight branches similar to the Indian system (Sharma 1981 : 458). There too, the 'moon' was supposed to be the king of drugs (ib.) as was the case with the Indian tradition (Shakuntalam 4.2). In the name of Hippocrates, the famous Greek medical theorist(s), the word 'hippo' meaning a horse, is incorporated. We have earlier seen that the Indian healing god Ashvinikumaraswere closely related to this cult, 'Ashva' meaning a horse. The name of Atreya, the famous Ayurvedic theorist, is also very interesting from this view. It stands similar to the Greek word Iatros meaning a physician (Peadiatrics, Geriatrics etc.). Thus e comparative philology is conducive to prove that the mythological sources of the Indian and Greek medicine must have been identical. But even from philological point of debate, Indians did not seem to have been at the receiving end. Various Greek and Latin terms in medicine seem to have been derived from Sanskrit originals and the case was definitely not vice-versa. It is apparent from the following list of some European words which are obviously of Sanskrit origin. For example,

Sanskrit	Greek Parallel	English Words
Asthi	Osteon	osteology
Kapala	Kephale	Encephalitis
Charma	Derma	Dermatology
Danta	Denta	Dentist
Janani	Gyne	Gynaecology
Parashrit	Parasito	Parasite
Pippali	Paperi	Pepper
Plavangam	Phlegma	Phelgm

Thus we see that while foreign contacts did little to influence India's own medical system, there is also not much weight in the theory that the rise of protestant faiths had much to materially guide the evolution of sciences in our country. True, the question of the growth of medicine may be attached to the philosophical development of materialism - or to the natural materialism. But basically the emergence of such a vital science has a more closer nexus with such socioeconomic factors like the generation of urban sites - the usual knowledge centres, and the enlargement of the clientele which could buy and support medical explorations. To add, great discoveries and improvements in science invariably involve the cooperation of many minds. Sciences cannot flourish in isolation and a cross-cultural process of development is a necessary prerequisite for their advancement. A review of the period concerned, demonstrates how independent medical minds could develop with the rise of rich and pleasure loving middle classes in post-6th century BC. And also how the amalgamation of numerous tribes and their cultures into national stream could prepare the essential background for promotion of medical sciences.

The sixth century BC., was, as noted at the outset, was a time of far-reaching social changes. Large part of the Gangetic basin had come under settled agriculture, and the advent of the plough-cultivation (used with iron-tool) associated with the increasing use of Sudras as institutional supplier of labour, created surpluses of commodities that could be profitably exchanged in the growing market towns of the region. The growth of surpluses brought into existence a new social class, a class of prosperous merchants and wealthy bankers, whose transactions were greatly facilitated by the discovery of metals, especially iron and copper. The most important fact indicated by our evidence is that the cash nexus was becoming the basis of economic relations in the second half of the sixth century BC. The Buddhist books , our main source of information of life of this age, make a common mention of currency, everything now, from the price of a dead rat to that of a holiday in Banaras, tended to be counted in terms of cash. The growth of the cash economy greatly accelerated trade and commerce, which came to hold a decisive superiority over other forms of property-creating institutions. The changing economic structure is well illustrated by the story of how a great banker of Shravasti bought a plot of land through cartloads of coins covering its surface.

The development of trade and commerce was based on the growth of numerous well-recognised trade routes crisscrossing farflung parts of the country. Riverine and seaports like Benaras, Kaushambi (near Allahabad), Surat, Broach and Sopara (near Bombay) were beginning to

flourish. Through Asokan inscriptions and other literature of Mauryan

Air View of the Remains of the Ancient City of Taxila (first century A.D.)

age, we discover a number of rich cities and towns bustling with an advanced urban life. Such urban centres also housed the more prominent of the state's subjects. They included men of opulence and power, who did not only desire health and freedom from ills but were also in position to afford the cost of medical researches and treatment. The clientele base of the physicians was further consolidated through the emergence of a number of dangers to health which usually accompany growth of comparatively complex habitations. The aid of medical men was also needed on municipal front.

The growth of medicine was further enhanced by the process of colonisation of hitherto sparsely populated or uninhabitated areas.

New land was being brought under cultivation and the forests were receding rapidly before the spread of new colonies of settlers and husbandmen. The economic life of the forest people was thus threatened by the encroachment of the advanced economic system, and the problem of economic security and social status confronting them was solved by their gradual fusion into the general Indian society through their gradual fusion into the emergent caste structure. It may be safely assumed that with them these people living on forest produce, brought to the mainfold their knowledge of herbs and drug preparation systems. It is in this light we can understand the advise of the Sushruta Samhita (1.36.10) that the Vaidya should gain knowledge of unusual herbal remedies from hillmen, herdsmen and forest dwelling hermits. The significant contribution of such tribes in the field of medicine is prominently clear with the fact that almost throughout the country the traditional professionals associated with delivery, minor surgery etc. belong to the low caste people such as Chamar, i.e. Cobbler, or Nai i.e. barbers.

The truth of the medical progress in India during the pre-Mauryan period to the early centuries AD. perhaps lies, by and large, in the above realities of social and economic evolution. The 'protestant' ethics of Buddhism or other sects were not more than the echoes of these far-reaching changes - their significance lay only in giving expression to the spiritual urges of the new classes generated by the economic revolution.

In course of the national expansion of the classical system of Ayurveda, powerful medical systems of certain communities, however, retained their individual entity, though they were grossly influenced by the former. Among such systems, the most prominent is the Agastya or more popularly, the Siddha system of the deep south. Sage Agastya has been frequently has been frequently mentioned as the introducer of Aryan culture into South India in later-vedic literature. And the term 'Siddha', literally meaning 'accomplished', is a well-known Sanskrit word. The Ayurvedic Bower manuscript of the 4th century AD. discovered at Kashgar also bears the name of Siddha-Sankarsha (along with Navanitakam, indeed) (Pandey and Pandey 1988 : 1). Still this system is evidently of trans-Vindhyan origin since it adds special stress on alchemy, a feature not so important in its Ayurvedic counterpart.

Irayangar, i.e. Shiva considered by historians as a deity of non-Brahmana origin, is also frequently associated with the genesis of this medical system (Gurusironmani 1983 : 33; Raghunathan 1984 : 10). In our opinion this tradition signifies the contribution of the rich herbal deposits of the mountains to this system of medicine. In fact the close association of Shiva with mountains is clearly indicative of his connection with some mountain-worship cult. The Siddha system itself is reported to have descended from heaven through Shiva via his wife Parvati, literally meaning the daughter of 'Parvata', i.e. mountain.

Besides Shiva and Parvati, other mythological figures related to the origin of the Siddha medicine are Murugan, Nandi, Agastya,

Theryar, Bhogar and others. At one place, Dhanvantari is also reported to have belonged to this gathering (Iyer 1933 : 15). The historical personalities who authored different Siddha texts are divided into two groups. Those who produced Tamil translation of Ayurvedic Sanskrit texts are called Bara while those who authored original medical treatises in Tamil belong to Thera group.

The tremendous influence of Ayurveda on this system is evident from the concepts, principals, and doctrines, both fundamental and applied, bearing strong similarity with the former. Both the dosha-dhatu concepts along with the five basic elements of Ayurvedic system have been incorporated prominently in the Siddha medicine. Minus the specialisation in iatrochemistry, the difference between the two systems remains more linguistic than doctrinal.

Influence of Ayurveda is equally reflected in the Pancha-Karma therapy of Kerala which is traditionally believed to be ancient but whose literature is available only in the Malayalam, a much later language. This five fold therapy primarily involves the system of embalming and massaging so well known in the Ayurveda. The dhara-karma part of it is a system in which liquid drug is kept in an earthen pot having small hole and hanging above the head of the patient so that the drug could trickle down on him. This may be originally a practice of folk therapy. In this deep southern state, there is also an old tradition of eight physicians whose progenitor is said to be Parashurama. The popularity of Ayurveda in ancient South India is assertively underlined also by a Chola inscription (11th century AD.) reporting students reading the Ashtangahridyam, the

famous Ayurvedic text (Krishnamurthy and Mouly 1984 : 47). On the testimony of Itsing, the 9th century Chinese pilgrim, we learn that 'all physicians in the five parts of India practised according to a book divided into eight limbs' i.e. the above Ashtanga Text (Mookerji 1960 : 539). The impact of Ayurveda on the primitive systems of the country is also revealed by the fact that the Santhals of the eastern India accept 'Kamru-Guru' as the original propounder of their medicine (Bodding 1925 : 289), which was seemingly of an Aryan stock.

The unearthing of a clay-seal in Harappan site bearing the picture of a seer sitting in yoga-posture (Sharma 1977; Photo plate no.6.7) has brought another evidence of the cross-cultural process of the development of Indian system of Yoga. Supposedly of a non-Aryan origin, the system of yoga has been incorporated into Indian system of health-maintenance. The old treatise Yajurveda (19.93) itself compares the yoga to a good physician who cures diseases. Radhakrishnan suggests that the phenomenon of yoga evolved gradually through stages (1931:339). The 5th Century BC. treatise Maitri-Upanishad refers to only six-folds of yoga. While it is stated to be an eight-fold system in the classical text on this subject like the Yoga Sutra of Patanjali (2nd Cent. BC.) (Yoga Sutra 2.29). These folds included, yama, i.e. abstention; niyama, i.e. observance; asana, postures, pratyahara, i.e. withdrawal of sense; dhyana, i.e. fixed attention; dharana i.e. contemplation and finally, samadhi, i.e. concentration. The last three were internal ones and more important while the first five were external.

As noted above, the 'asanas' or postures were originally a part of the yoga system. But the early text yoga sutra as well as the latter yoga vashistha does not mention any list of such asanas or postures which were later multiplied greatly in number. The post-Gupta books like the Shiva Samhita and Gheranda Samhita mention 84 major asanas. Many of them were named after the natural poses of different species like fish, cobra, hen etc. But more popular of the asanas are those of topsy-tervy pose, bow-pose, or lotus-pose. The last pose is also the lone pose prescribed by the yoga sutra (2.46) for meditation.

Both the yoga and asanas are of great medical potentiality. Sigerist (1961:173) narrates how a German sinologist saw relief from light colds, headache, neuritic pains or like from a beginners' course of meditation. But strangely enough, the doctrine of Ayurveda does not involve Yogasana system with notable prominence. It seems to be more concerned with 'vyayamas' i.e. different body exercises (Charaka Samhita 1.6.24; 1.7.31; Sushruta Samhita 4.24.8).

It would also be of relevance to note that the medical astrology which stressed on cure through wearing of different metals and stones, stands practically outside the domain of the basic Ayurveda. The antiquity of this system is, however, quite great and it finds occasional references in such early texts as the Arthashastra of Kautilya.

Having thus expatiated the growth of the Ayurvedic system and its expansion, the next important question which confronts us is related to the cultural setting of medicine in ancient Indian traditions. Basically, the Ayurvedic notion of a happy life was not exactly to the liking of the austere, ascetic and puritanical law-givers. The great stress in the Ayurveda to associate itself with the Atharva Veda, (Charaka Samhita 1.1.42; Sushruta Samhita 1.1.3) was also in the nature of a challenge, for this Veda enjoyed a dubious reputation in the orthodox circles as we would see later. Certain scholars like Chattopadhyaya (1977) would like to observe that the rational attitudes of the Ayurvedic theorists directly hit the ideological base of the hierarchical society. Therefore, there was a lot of hue and cry in Brahman Dharma Shastras to dishonour the practice of medicine. Inspite of all these, the physicians never failed to command esteem of the society for their beneficial practice.

Theoretically also, it is hard to discover examples of contempt shown to the physicians minus the frequent taboos on the food-untouchability imposed on them (Gautama Dharma Sutra 17.7; Vashishtha Dharma Sutra 14.1 or the later Manu Smriti 3.152; 3.180; 4.212; 4.220). Based on a study in connected passages, it may be opined that the motive in looking down on the vaidya was because in the course of his duties, he came into contact with blood. Blood is included among the 12 impurities prescribed in the Manu Smriti (5.135). Manu is full of despise towards the physician only on the account that he is impure and unworthy of common dining. It appears that his code has otherwise no grievance against the physicians' community, which is certainly

in line with the great regard shown to them in the Vedic texts which are so venerated by the law-giver. That the opposition by orthodox circle to the medical professionals was practical and institutional is also illustrated by the reality that most of the commentators of the Charaka text are brahmanas of religious bent. If there would have been a general hatred towards the vaidyas among the top classes of Hindu hierarchy the brahmana commentators could hardly hide their feeling against them. The brahmanas were engaged in the theoretical development of medical science. They were also engaged in the medical profession which did command a high social status as we would note later.

Regardless of the occasional deviations, the discipline of the Ayurveda fitted well harmoniously with overall Indian cultural setting. The Gupta age book Brahma Vaivasta Purana (1.16.9) announces the Ayurveda as the fifth Veda. The Charaka Text (7.1.14) prescribes for invocation of gods like Brahma, Vayu, Agni, or Surya for health and cure. Many medical formulae of Ayurveda are abscribed to Brahmana gods like Vishnu and Surya (Mukhopadhyaya 1923: vol.I 19;87). Dhanvantari with whom the Ayurvedic treatises asscciate themselves proudly (Sushruta Samhita 1.1.16) has been frequently regarded as a venerable deity in Brahmana treatises like the Manu Smriti (3.85); Markandeya Purana (26.19); Bhagavat Purana (6.8.12) or Vishnu Dharmottara Purana (2.95.5). The Charakas are also included among respectable classes of priests in Vayu Purana (43.10). The traditional approach to the different drugs or aushadhis (literally meaning 'hot herbs') also reflects great sanctity attached to the craft of healing. They are supposed to be of divine quality. The capital of herbs'

kingdom was the Aushadiprastha - the native place of Goddess Parvati (Kumar Sambhavam 6.33). At one place Lord Krishna declared that he himself was the 'aushadhi' (Ahmaushadham, Bhagawat Gita 9.16).

While the theorists of Ayurveda attached enormous importance to keeping the body sound and safe, they were also not indifferent towards the contentment of the 'soul' (Sushruta Samhita 1.15.48). The physician himself was reportedly keen to attain all the four desirable objects of life (ib.1.2.5) which included, among others 'moksha' - i.e. salvation and constitutes an important aspect of brahmanical philosophy of Purusartha (four aims of life). In fact, most of the required qualities of physicians (ib.1.10.2; 1.10.8) or patients (ib. 1.34.10) can be traced to be inspired by similar prerequisites laid down in case of other persons such as ascetics and their followers. The style of oath to medical pupils, the rituals involved, the austerities required on the part of the student, the student-teacher relationship, the emphasis on the limitlessness of knowledge, the association of wordly prosperity, fame and ethical practices, all are, by and large, in complete conformity with the mainstream of ancient Indian thought and practice.

That the Ayurvedic traditions harmoniously co-existed with the overall Indian cultural set-up is also obvious from the inclusion of popular folk-therapy systems into Ayurvedic texts. In fact, the eight branches of Ayurveda included, among others a science of what is called demonology (Sushruta Samhita 6.50-53 three chapters). Cures prescribed in such sections usually involved use of such things as the hairs of goat, dungs of owl or vulture etc. The above relevant passage of the Sushruta Text bears high similarity with the materials

in some of the concluding chapters of the Arthashastra. The belief in such therapy is often reported in the ancient stories (Pancha Tantra 5.92) and plays (Shakuntalam 7.20). But since chapters dealing with such subjects are included in the closing portions of the Sushruta Samhita or for that matter in the Arthashastra, it seems highly probable that this therapy commanded the least regard. Such subjects were perhaps included in the classical texts just as a customary gesture to honour the traditional beliefs.

The combination of prayers with medicine is the most ancient feature of human civilization. Gradually with the vertical growth of science along with its horizontal expansion among the people, the domain of superstitions has been eroded to a great extent. But still the modern cure of diseases, particularly those related to those of babies, is frequently supplemented by prayers to demons or deities. This has been the most important reason behind the fact that one of the eight parts of Ayurveda the Kumarbhritya, 'baby-cure', i.e. paediatrics contains considerable mythical components in it.

Besides the 'Kumara bhritya', paediatrics, other branches of Ayurveda constituted, the Shalya - major surgery, Shalakya - minor surgery, Kaya-chikita - medicine, bhuta-vidya - demonology, agada-tantra - toxicology, rasayana - 'science of tonics', and vajikarana - aphrodisiacs (Charaka Samhita 1.30.28; Sushruta Samhita 1.1.3). This divison seems to be more theoretical and we practically do not discover physicians divided according to these specialisations. More popularly, the physicians were divided into general physicians, surgeons, elephant doctors (Kaka Jataka), no.140, Arthashastra 2.32.11) and horse doctors (Arthashastra 2.30.43), and specialists

in serpent-bite cure (Campeya Jataka no.506; Arrian's Indika, McCrindle 1876 : 223). Sometimes we also hear of the specialists in demonology (Padakusalamanava Jataka, no.432). At one place we also hear of the dentists (Pant 1986 : 227). It is, however certain that there were no specialists in the sense that every physician lay his hands on all types of diseases and injuries. And as the ancient Greek traveller Arrian observed the snake-bite curers were also skilled in curing other ailments (McCrindle 1876 : 223).

Among the famous specialist physicians we know about a veterinary theorist Shalihotra (Pancha Tantra 5.69). Among the renowned paediatricians the name of Jivaka of Buddhist literature may be taken. His full name is Jivaka Kumarbritya, i.e. Jivaka the paediatrician (Chullaka Setthi Jataka, no.4). But throughout his career which is described copiously in Buddhist literature, he is never found as engaged in paediatrics. On the contrary he is sometimes described as surgeon (Sattigumba Jataka no.503; Chullahamsa Jataka no. 533) or general physician (Mahavagga 8.1.8) Perhaps this title signified the physician's regard to the prince (Kumara) who reportedly brought him up when the former was an orphan kid (ib.). It may be relevant and interesting to note that all the traditional physicians in Thailand are called Kumarbhritya (Sharma 1981 : 492). Specialist paediatricians are, however also mentioned in Kalidasa (Raghu vamsha 3.12).

Among the successes of ancient Indian medicine may be noted the cure of snake-bite (McCrindle 1876 : 223) and battle-wounds (Raghuvamsha 14.4). A standard of treatment of such wounds must have been attained in those days otherwise the punishment of cutting limbs described frequently in ancient texts (Manu Smriti 8.269; McCrindle 1876.72) could have virtually meant death penality which was certainly not the case. The standard of examination and treatment of the cases of parasitic diseases (19 types of them are described in the Charaka's text 1.19.9) may also have been quite developed. An old story in Divyavadana a 2nd century AD. Buddhist text, narrates how a queen cured the ailment of the emperor Asoka by examining the parasite which caused it. In washing out ovary having a dead foetus, considerable success seems to have been attained by ancient physicians as it is reported not only in the medical text Sushruta Samhita (4.15.13) but also in the epic Ramayana (5.28.6). They also seem to be familiar with the fact that certain diseases were infectious (Ashtadhyayi 3.3.16).

As regards the cure of other diseases, described at the outset of this chapter, empirical studies need to be conducted to explore the medical merit of the different prescriptions of the Ayurvedic texts. But this much must be vouchsafed that the ancient physicians were generally trusted upon (Ramayana 3.40.1, Mahabharata 1.102.71), and their treatment was usually accessible for the general masses. In most cases the diseases must have been cured or controlled by ancient Ayurvedic physicians, since the general picture reflecting from the non-medical books of ancient India, is of a relatively healthy life. The sustained modern demand of the harmless drugs of Ayurveda as well as the confirmed merit of Ayurvedic therapy in

respect to diseases like cardiac arrest, liver troubles, and diabetes also pointers to the great medical potentialities of this ancient Indian system. The classificiation of diseases in more than one thousand categories, as described in the Sushruta Samhita (Ray, Gupta, Roy 1980 : Table 7) is also an evidence of the development of nosology and symptomatology in medical science attained in ancient India.

As we all are aware, India never lagged behind the rest of the world in the region of science at least upto the 16th century AD. As a matter of fact it pioneered numerous advances of the fields of mathematics, metalurgy, architecture, chemistry and linguistics. Examples abound to illustrate the mental vigour and brilliance of the Indian people. It was but the ancient Indians who introduced the numerals and decimal to the world. They had an excessive imaginative and philosophical strength. The Iron Pillar of Delhi and the Sultanganj, Bihar copper colossus image of Buddha, blocks of sandstone of 50 feet long and 4 feet square (for emperor Asoka), the wonderful stone polish which cannot be duplicated even today, and the unexcelled dexterity to engineer a big dam as the Lake Sudarshana in Gujarat all go to demonstrate the level of perfection acquired by the ancient Indians in a variety of fields. Keeping in view of this skillful standardisation in all fields where they excelled, one can imagine the heights attained by them in the field of medicine and health care.

CHAPTER - III

Medical education and practitioners

The Brihadaranyaka Upanishad 2.4.10; 4.5.11) asserts that all existing branches of knowledge were breaths of the god Brahma. This statement signifies the great sanctity and esteem attached to the field of learning in ancient India (also, Ishavasyopanishad; 1.11). Different passages in the classical Ayurvedic texts pertaining to the duty and demeanour of both the teachers and the taughts leave little doubt about the high order of sanctity attached to the pursuits in medical arena.

Still, the medical branch of learning has certain peculiar characteristics. People have a general tendency to avoid the expert and guide themselves on the basis of their own experiences. To learn one or two medical clues through personal experience is not unnatural. Some one rightly states, every man is either a physician or fool at forty. The great majority of all cases of illness is never attended to by physicians but patient himself or his relatives (for example vide Arthashastra 2.25.35). Besides, as a recent exploration in this field brought the statistics, as many as 93 per cent deliveries are conducted by non-trained hands (Qadeer 1990:99). Therefore, it is not unsafe to conclude that in India's past the above ninetyper cent of the ailments were treated by the individuals either with a background in the popular traditional system, sometimes mixing a bit of Ayurveda, or in the simple ojha charms (sorcery or exorcism). This was particularly true with the cases of gynaecology(Arthashastra 3.20.17), insanity and baby

diseases. The cases of delivery are still being handled in majority cases by the low caste female descendants of the aboriginal tribes absorbed into Indian caste system around the Mauryan age. Thus in most cases, the professionals in medicine learned their craft in family settings. But it is more than certain that, inspite of hereditary professionals having upper hand on the field of practice there was quite a number of trained experts who underwent a thoroughly systematised education of medicine.

The ancient Indians put a greater stress on learning medicine than on other sciences. It is quite clear from the observation of the ancient Greek traveller Strabo who reported that Indians made no accurate study of the sciences except that of medicine (McCrindle 1901:32-79). The term 'Chikitsa' for medical science in ancient India itself literally means 'the science of query (Ghurye 1963:320). The Charaka Samhita (6.14.52) also asserts that one was to become a physician only through learning and not by birth. Reference to families of physicians is found in the Jataka stories (Visvanta Jataka, no.69; Kesava Jataka, no.346) but such families seem to be exceptionally rare at that time because we do not come across other references. However, there was a tendency to accord greater recognition to families having more than one physician. In Charaka Text (3.8) students belonging to such families were given priority in admission.

Besides the physicians the Ayurvedic texts also refer to the nurses (Charaka Samhita 4.108); drug compounders and masseurs (ib. 1.15.6). But we fail to discover any training system for them. It may be assumed that after a little practical directions they might have been taken into the service. This inference is confirmed by

Arthashastra (2.27.5) which prescribes old prostitutes to be appointed as nurses.

Before we move forward to review the system of medical education in ancient India, it would be quite fitting to have an eye on the subjects which the students of yore studied. It would also help us to determine the most popular disciplines of learning. The most important thing to be noted in this direction is the reality that the avenues of learning as such were open only to those who were either the brahmane, the priestly class or the Ksatriya, the warrior class. The norms established in this direction were strict.

Like in other civilizations of antiquity the ancient Indian academic curriculum comprised of a mixture of subjects pertaining to religion, philosophy, ethics, geography etc. Gradually with the advancement of the art of writing, subjects like the lineages of kings and priests were also included in this group. By the 6th century BC. the ancient Indians were able to enumerate subjects like history, (Brihadaranyaka Upanishad 2.4.10) but the texts on such subjects were the same old compilations like the vedas, their commentaries, the Brahmanas, and, latterly, the Upanishadas and Sutras. By the age of Buddha, those acquiring scholarship of these books were supposed to be learned persons.

Of these books, the Atharva Veda happens to contain a variety of medical topics and is thus the oldest books on the subject. But this Veda commanded less respect in the orthodox circles. Though out

of its total 6,000 stanzas, about 1200 have been incorporated into it from the Rigveda, at frequent places stress has been given only to the learning of the other three vedas (Mahabharata 1.29.35, Matakabhatta Jataka, no.18, Manusmriti 1.23, 4.124, 11.265 etc.). Therefore it may be assumed that not a great number of students initially read the Atharvaveda. However, the book established itself as a Veda much earlier on. The turning point appears to be the sixth century BC.

The later works frequently refer to many branches of knowledge other than the Vedas (Chandogya Upanishad 7.1.1., Brihadaranyaka Upanishad 2.4.10, Ashtadhyayi 1.9.1., Kosiya Jataka, no.130, Asadisa Jataka, no.181). It so really happened that the proper performance of the sacrifices prescribed in the Vedic texts as well as their accurate pronunciation and comprehension required the help of six subsidiary studies. These were phonetics, rituals, grammar, philology, metrics and astronomy. Thus it appears that the necessity of learning the Vedas in their full thoroughness gave rise to diverse branches of learning. Hence perhaps the notion that all knowledge descends from the Vedas. The diversity in the field of learning attained by the 6th century AD. is very illustratively reported in the Chandogya Upanishad (7.1.1-4). At one place, the famous sage Sanatkumara asks Narada, the celestial seer, as to how many subjects had the latter studied : Narada replies : Four Vedas, Itihasa-Puranas (history), Pitrya (manes-ritual), Rasi (zodiacs) Daiva (fortune-telling), Nidhi (treasure-tapping), Vakovakya (logic), Ksatra-Vidya (polity), Naksatra Vidya (astronomy), Sarpa-Vidya (snake lore) and also subjects like

Ekayana Deva-Vidya, Bhuta-Vidya and Devajana Vidya (ib. 7.2.1., 7.7.1).

With the rapid growth in the complexity of material life in the succeeding centuries, the diversity in the disciplines of learning also increased. In the field of grammar, Panini and his colleagues reshaped and refined the science of language. There occured also a great development of numerous philosophical schools like those of the Jatilakas, Charvakas, Ajivakas and most prominently the Buddhists and Jains. All this contributed to the increased recognition of the mundane branches of learning. By the fourth century BC. even the orthodox circles of ancient Indians did not hesitate to accept a discipline like medicine as separate from religion and ethics. This possibility also championed the popularity of the Atharvaveda. The instances are not lacking at all to demonstrate that this Veda used to be venerated at par with its other Vedic counterparts. The Putreshti Yagya of king Dashratha, meant for being blessed with an offspring, involved different Mantras of the Atharveda (Ramayana 1.15.2). In Mahabharata (1.70.39), seers in the ashrama of a famous sage, Kanva, are reported to chanting the mantras of this Veda. Kautilya the brahman Prime Minister of Chandragupta Maurya prescribes utterance of Atharvavedic mantras before attacking the enemy's army (Arthashastra 10.3.35). In such later works as the Raghuvamsha (17.13) this Veda has been mentioned with great esteem. At one place the code of Manu (11.33) itself prescribes that a brahman should study the

mantras of the Atharvaveda. In sum, it may be assumed that inclusion of medical topics in the curriculum of orthodox system of learning was a fact by the 5th century BC.

However, it may be conceded that before the Mahabharata medicine does not appear as an educational discipline in itself. As a matter of fact, the first specific reference to medicine as an independent branch of learning is available in this epic poem (Mahabharata 1.1.67, 12.28.44). A later text like the Mahabhashya (1.1.1) of Patanjali of 2nd century BC. also refers to medicine as a separate discipline (Puri 1957 : 146). The contemporary king Menandar is also reported to be in the know of medicine as a separate subject (Milinda Panho 1.9.1.). All this points out that the process of emergence of medicine as a field of learning was over by the 3rd century BC.

There is no evidence of any taboo being imposed on the study of medicine as such. But still after a survey in the connected passages of the ancient Indian literature we may assume that this field attracted no more than the five percent of the total brahmana students and some three percent of the total Ksatriya students in the antiquity of India. The brahmanas were more interested in developing the knowledge of religious scriptures. On the other hand the Ksatriyas showed more enthusiasm to fields like the Arthashastra i.e. 'science of polity' (Ramayana 3.43.34; Mahabharata 1.63.112; Prtigya Nataka 2.13; and the Dhanurveda i.e. practical instruction in the use of weapons

and vehicles of war (Ramayana 1.18.36; Mahabharata 1.220.72, also vide inscriptions of Kharvela and Rudradaman).

However, the medical pupils of antiquity also included students outside both the Ksatriya or Brahmana classes. Usually they were the Vaisyas, the third rank class of the merchants and husbandmen, but sometimes even Sudras, the lowest in class hierarchy (Sushruta Samhita 1.2.4). It is more than certain that medical science was a specialised subject and pupils started learning it after attaining maturity. That the medical students were matured in age is confirmed by the injunction that they must not get infatuated with girls. By that time the pupil was a master of such branches of learning as grammar and mathematics.

It is indeed interesting to explore the subjects which the general students of minor age studied before specialising in such branches as the Vedic texts, the Dhanurveda, the Arthashastra and Ayurveda. The educational process started with three 'a's 'adhyayana', i.e. reading, 'aksara', i.e. writing, and 'anka' i.e. the numerals. This was completed by the age of six. The first subject to be taught was the Sanskrit language in which were preserved the sacred books and which was the language of culture. (In fact, even the heterodox families of Buddhists or Jains, who preferred Prakrit, or later Pali, taught elementary Sanskrit to their children). On the testimony of Itsing, we learn that at the age of six, children were taught primary grammar containing 300 stanzas. Then, at the age of seven, 1,000

stanzas from Panini's grammar was introduced to the students. Basically a grammar, this Ashtadhyayi or the'Eight - Chapter Book' of Panini included a variety of terms related to geography, economics, polity, culture as well as medicine and many more topics. A student was supposed to memorize these 1000 Shlokas by the age of ten. Then he had to study the 'dhatus' the verb-roots for two years. Student received his initiation ceremony, the Yagyopavita at this stage and for the coming three or four years he studied what was later known as Kashika Vriti - a combination of grammar and general knowledge. And possibly after the age of 16 he opted for specialisation in his field of choice. Thus it may be assumed that a new student of classical Ayurvedic learning had a good knowledge of the basics of the predominent Vedic tradition.

As in the case of other branches of learning the usual training centres of medicine were those 'Ashramas' of old teachers who lived in the lonely portions of jungles. The description of places around such ashramas are found in different medical treatises reveals that these ashramas were situated away from the hustle and bustle of residential spots. However, the references to the practice of begging as a means to support the economy of such centres (Charaka Samhita 3.8.13) indicate that these ashramas were also not situated in the distant wilderness. The frequent stress on the practicals in the Sushruta Samhita (1.4.3; 1.10.3) may also suggest that some of the ashramas were situated in the close neighbourhood of the usual habitation centres. Regular begging was possible in the towns or cities only and we may also assume that the teachers preferred the vicinity

of towns to establish their ashramas. This may be more true in the cases of teachers specialising in surgery.

For general physicians, the lone places around the hills and mountains rich in herbal deposits were more fit for establishing the ashramas. Based partly on the material support which the keen students brought with them, and partly on the availability of edible fruits, many ashramas ran in the foothills of the Himalayas. There are numerous references to such ashramas in Himvata parshava (Charaka Samhita 6.19.3); Kailasha (ib. 6.21.3); Chaitra Ratha (ib.6.26.6); Dhaneshayana (ib. 6.13.3); and Kampilya (ib. 3.3.3). In majority of cases teachers stayed permanently at one place with ten or like students. Some teachers, especially those whose qualification was greater, chose to wander around like what may be named as a visiting professor. The famous sage Atreya is shown to have visited all the ashramas referred to above.

But, despite the fact that the ashramas had to play the predominant role in medical education, the better known urban seats of learning were important institutions imparting training in the discipline in question. From the point of view of medical-training, Taxila appears as an outstanding centre of ancient India. The privileged geographical location of this place made it a natural centre of conference for various wandering teachers of the Himalayan ashramas. As a matter of fact it is already a renowned seat of learning even as the curtain of history lifts up before our eyes. Though nowhere named in Charaka, Taxila's popularity as a learning centre is crystal clear

from the fact that no less than 108 Jataka stories refer to this town as such (Sanjiva Jataka no.150; Sustasoma Jataka no.537 etc.). The famous Buddhist physician Jivaka is described as a student of Taxila (Mahavagga 8.1.5). Apart from medicine it also offered specialised courses in military sciences and law (Mookerji 1960 : 489). The excavations at the site of Taxila, about 32 kilometres, west of Ravalpindi by the Jhelum did not uncover any monumental building like the one at Nalanda. This was probably due to the fact that owing to foreign invasions to which it was ever exposed, Taxila university was destroyed at a very early date. It may be recalled that the Nalanda university had also ceased to function as an academic centre after the invasion of Bakhtiyar Khilji. The standard of educational training at Taxila was quite superior and many celebrated intellectuals like Kautilya were its alumni. But it is strange to note that certain teachers were engaged here to teach magic-charms and spells too (Anabhirati Jataka,no..185; Sanjiva Jataka,no.150).

As regards the teachers, evidences from both brahmanical sources and Buddhist literature (Sustasoma Jataka no.537) suggest that the senior pupils who wished to stay in the ashrama instead of going back to his native place were appointed as assistant teachers. In normal cases, the profession of teaching was reserved only for the brahmanas (Manu Smriti 1.88-91). But this was not always true for the medical faculty. We hear of teachers belonging to the warrior class, or the class of merchants and husbandsmen also (Sushruta Samhita 1.2.4). Even sudras were allowed to teach medical pupils (Charaka Samhita 1.2.5).

The Manu's Code of Law (2.241) or the earlier Dharmasutra of Baudhayana (1.2.40) also permit non-Brahmana teachers at the time of emergencies. But usually only non-brahmana pupils were taught by non-brahmana teachers (Charaka Samhita 1.2.4).

For the excellence in the pursuit of learning, teachers of any class or caste were approached and paid veneration. In one of the Upanishadas, we discover one leper being approached by some curious students (Chandogya Upanishad 4.1.8). Even the Code of Manu (2.238;240) praises one's effort to learn from the lowly people. It was probably in this background that the Sushruta Samhita (1.36.10) advises the medical trainees to gain knowledge of unusual herbal remedies from hillmen, herdsmen and forest-dwelling hermits.

As regards the usual teachers of medicine the essential qualities required on their part were of excellent standard. Though this standard was hardly maintained in practical cases, the qualifications of a teacher as prescribed in Charaka Samhita (3.8) would provide us an idea of the medical education system in the India of antiquity:

'A teacher should be one whose doubts have all been cleared in respect of medical scriptures. He should be possessed of experience, he should be clever, he should be compassionate towards those who approach him; he should be pure of conduct, he should have a practised hand; he should have all the implements of his profession. He should have all the organ of sense; he should be conversant with the nature; the tendencies of the healthy and diseased; he should be one whose

knowledge of the medical science has been supplemented by knowledge of the other branches of study. He should be without malice. He should be without a wrathful disposition. He should be capable of bearing privations and pain; he should be one well-affected towards disciples and disposed to teach them, he should be capable of communicating his ideas to pupil that seek his instructions.'

The norms presented for the relationship between the teachers and the taught were also quite high. An idea in this regard may be incurred from the following lecture given by a teacher to his pupil on the commencement of the course of study:

"In sleep, in rest, or while moving about - while at meals or in all acts thou shalt be guided by my direction. Thou shalt do what is pleasant and beneficial to me.... If I, on the other hand, treat thee unjustly even with the perfect obedience and in full conformity to the terms agreed, may I incur equal sin with thee, and may all my knowledge prove futile, and never have any scope of work or display". (Sushruta Samhita 1.2.5).

Among the alumni of medical discipline in ancient India the absence of female students is a most striking feature. The reference to medically trained women occur very rarely (Yajurveda 12.199). In fact, during the Sutra period, i.e. roughly from the 6th to 5th century BC., girls were never behind boys in pursuit of learning (Mookerji 1960:208). The ancient text Ashtadhyayi (6.2.86) takes notice of girl-students. The early Greek traveller Strabo also noted that women

studied philosophy in India (McCrindle 1901:67). It seems probable that the female-participation in field of learning was not a strange case. But with the increase in the diversity of the branches of learning as noted above, the duration of a course gradually became too extensive. This was particularly true of specialised courses like medicine which started only after the pupil attained maturity. Progressively it became difficult for female students to complete their studies because they were disposed of in marriage by their guardians in the middle of the course. Hence a time came when guardians discontinued sending their daughters to seats of specialised learning and started prefering education at house. With the gradual lowering of the marriage age all this meant complete want of girl trainees in at least a discipline like medicine. As per provision of the Manu Smriti (2.67), women need no education and for them their marriage itself is initiation or 'upanayanam'.

As regards the caste status of the medical students, we have examples of non-brahmana youths studying medicine as noted above. The Charaka Samhita (1.30.29) describes that while the brahmanas studied medicine out of the compassion to the people, the ksatriyas did so to keep people protected, and the vaisyas for the sake of commercial return. At one place, even the Manu Smriti (1.90) permits a vaisya to pursue studentship. The avenues of medical training were open also for a sudra on the condition to being from a decent family (Sushruta Samhita 1.2.4). This reference is indeed of a historical significance and it may lead to the inference that some of the sudras, the labour class belonged to high families (kulguna-sampanna; ib.).

The essential qualities required in a medical student as prescribed in Ayurvedic texts (e.g. Charaka Samhita 3.8) are parallel to those prescribed for students of sacred scriptures (e.g. in Gautama Dharma Sutra 2.18.23). These qualities included absence of such features as infatuation for women, and shunning from such bad habits like gambling, hunting or sleeping during day time. Stress was also given on the student's academic calibre and excellence in memorizing passages.

The Ayurvedic texts do not mention the economic organization of their training centres. But an idea of the economy of training centres may be gained through different passages pertaining to the general education which was not far different in character.

Ashramas as described in ancient books present the picture of a spot situated amidst murmuring pines and hemlocks. The trees surrounding them bore variety of fruits and were not an unimportant support to dinner for the teachers and pupils in the ashramas. Another major support came from the rich houses nearby who cherished donating essentials to the respected teachers. Begging was another means noted above. It also appears that the pupil joining the ashramas brought with him essential materials so as to support himself during his stay. Along with materials needed by him he also brought the acharya-bhag, i.e. the teacher's share (Dut Jataka no.478). Besides this, the different ashramas received support directly from the king and his family. Prince Rama is described as giving donations to different ashram-dwellers (Ramayana 2.32.13) before leaving to the forest-exile.

The Jataka stories describe that students offered fee for instruction before entering schools at Taxila (Sustasoma Jataka, no.537). They also tell that those pupils who could not bring the 'acharya bhag' served their teachers and attended night-classes arranged specially for them (Tila Mutthi Jataka no.252). But the system of repaying fees after the completion of study was also not uncommon (Dut Jataka, no.478). It seems that no student was to be refused admission on ground of non-payment of fee. In the Malavikagnimitram (1.17), a play by Kalidasa, a passage demonstrates that a teacher found guilty of misdemeanour was treated as a mere trafficker in learning.

References in the Sutra texts communicate that the annual sessions started in July-August even in those days (Gautama Dharma Sutra 16.2; Mitra 1964:84). The students were not allowed to visit their home or leave the ashrama before the conclusion of study (Vasavadattam 1.12-13). But certain days were left out for holidays. Their list as described in the medical treaties (Sushruta Samhita 1.2.9) are corroborated by the Dharma Sutra literature (Gautama 16.5; Vashishta 13.5) and they included the eighth day of the dark half of months alongwith the last two days of the each fortnight. In case of emergencies also study was postponed. The regular days were perhaps utilised for the mundane activities of the ashramas.

The daily session of study started well before the dawn (Charaka Samhita 3.8.7) and continued upto dusk with normal intervals for lunch etc. Study at the night-time was usually suspended as it was fixed for non-serious discourses. But the industrious students were allowed to continue study after sun-set (Mahabhashya 11.4.32). The grammar of

Patanjali mentions a student studying in a quiet place at night after protecting the light from wind (ib. 3.1.26).

The most important feature of the process of studying was the system of rotting (Sushruta Samhita 1.3.54). A student was supposed to get by heart the numerous passages of the medical treatises. About the medical text books we know nothing concrete save the Charaka Text on general medicine and the Sushruta Text for surgery. But references to other treatises in Charaka (3.8.3) and Sushruta (1.4.7) and Milinda Panho (4.7.20) warrant the conclusion that the different medical centres kept library with them. The books were written by hands on one side of the burch leaves. Tied together the bunch of such leaves was called 'pustaka', i.e. pack or 'grantha', i.e. tied bundle. A specimen of ancient Ayurvedic text was unearthed near Kashgar, Central Asia. As told elsewhere it is now kept in one of the Oxford libraries, but it is available in photo-copy in the Central Secretariat Library, New Delhi (Hoernle 1893).

The inclusion of such topics as the 'Kumarabhritya' and 'Bhuta Vidya' in the classical medical treatises suggests that lessons on the popular beliefs and folk-loric treatment were also included in the medical curriculum of an Ayurveda student.

The study of classical texts was supplemented by individual experiences and practicals. The great stress on the practicals in the Ayurvedic studies is underlined by the announcement of Sushruta that

one possessing theoretical knowledge without practical experience is like an ass, ladden with logs of sandalwood, that labours under the weight which it carries without being able to appreciate its virtue (Sushruta Samhita 1.4.3). This text (1.10.3) prescribes that a student should enter into medical practice only after having acquired practical skill and having performed operations on dummies.

Instances from the brahmana text Arthashastra (4.7.1) and the Buddhist Divyavadana (ed. V.S. Agrawala, p.386) indicate that in some circles at least the idea of dissection for medical purposes was not wholly unknown. But usually even the touch of corpse was severally tabooed (Manu Smriti 5.135). Therefore, we have the story that Sushruta placed a new corpse in a basket in a running river for a week. Thus, the flesh disintegrated so that it might be removed by scrubbing with a long, stiff brush to expose the intestines which might be thus studied without physical contact (Sushruta Samhita 3.5.49).

The practicals required in the specialisation of Charaka Text was related to the identification of different herbs. Though this text saw medicinal merit in every herb (Charaka Samhita 1.26.12) the task of searching of medicinal herbs was practically difficult. In the Ramayana (6.101.33) we discover that in one emergent situation, Hanuman failed to identify the herb for which he was sent to a hill. At another place Rama the exile wandering restlessly in the dense forest to look out for his kidnapped wife Sita is compared to a physician searching medicinal plants (Ramayana 3.67.15). Another passage underlines the importance of practical experience in identification of the herbs. If we are to believe the Buddhist text Mahavagga (8.1.5), Jivaka the

famous physician, when a student at Taxila, was told to bring to his teacher any non-medical plant from within an area extending a yojana (4 miles?) in space. After some days, Jivaka returned back to his master's place with nothing in his hands. He was then allowed to embark on medical practice.

Seven years might be the normal length of the course in Ayurvedic studies as was the case with Jivaka in the just narrated Buddhist story. But since Jivaka was allowed by his mentor to leave studentship only reluctantly, the course length might be much longer. The later commentary on the code of Yagyavalkya, the Mitakshara (2.184) prescribes the length of an Ayurvedic study to be of only four years. But this perhaps only signifies the declining state of the Ayurveda around 12th century AD.

As the Charaka text describes it in its familiar poetic style, weapons, water and learning are wholly dependent for their merits or demerits on their holder (Charaka Samhita 1.9.20). Therefore, acquiring medical knowledge was not enough and great emphasis was laid upon its proper use by the physician commencing his vocational career.

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It is a truism to state that the degree of honour accorded to the medical man stands supreme among the learned professionals, being vital to the health, happiness and survival of the race. In India, the earliest notice of medicine being practised for livelihood comes in the Rigveda (9.112.2) itself. There is sufficient evidence to show that the ancient counterparts of the modern

doctors in India were also men of status and power. Perhaps it was not only due to its profitability but also high prestige accorded to learned physicians that the profession of medicine attracted a host of the imposters (Charaka Samhita 1.11.51).

Elsewhere we have gone into the classifications of the medical practioners in ancient India. Besides the higher rank of general physicians there was also a second rank in the profession of medicine. The most important in this line were the Paricharaka (nurses). The nurses included both males (Sushruta Samhita 1.34.12) and females (Charaka Samhita 4.10.8). Ideally they were to be cool-headed and pleasant in their demeanour, strong and attentive to the requirements of the sick, and strictly; indefatigable followers of the instructions of the physician (Sushruta Samhita 1.34.12). A Charaka Samhita (1.9.8) passage suggests that they underwent a short training course in nursing before joining the field of medicine. Besides extending general help, a nurse was also expected to massage the body of sicks in need (Charaka Samhita 6.24.188).

Besides the Paricharakas there were also the groups of professionals called Matrikas (Arthashastra 2.27.5) and the Dasis (ib. 3.20.17). The Matrikas however, appear to enjoy a very low status because they were mostly the aged prostitutes or courtesans. The Dasis, 'maid servants' were engaged generally in gynaecological services. Different passages describing these three types of craft-persons in the Arthashastra, indicate that they enjoyed a social status equal to the rank of domestic servants.

The staff of an Ayurvedic 'Aturalaya' i.e. ' the house of sick' included, besides the nurses, the drug-compounders, musicians, singers and cooks (Charaka Samhita 1.15.6). The presence of musicians and singers on the staff of a Vaidya suggests that a great importance was accorded to the mental aspect of particular ailments. It also proves that the ancient Indian doctors was much more thoroughly concerned and involved in the overall recuperation of his patients than his modern counterparts. Though it might be indicative of the folk-loric origin, this music system must have given a benign touch to his process of treatment which is sadly lacking in modern medicine.

Coming back to the physicians, we discover that ideally a Vaidya was to have four essential qualities - (i) clear grasp of theoretical contents of Ayurveda, (ii) a wide range of experience, (iii) practical skill, and (iv) Cleanliness (Charaka Samhita 1.9.6). According to the Sushruta Text (1.10.2) 'a physician should be cleanly in habits. He should walk about with a mild and benignant look as a friend of all created beings, readly to help all, and frank and friendly in his talk'. The follcwing sermon given by the teacher to the senior students commencing his practice may help us gauge the ideal image of a Vaidya in ancient India.

"Thou shalt renounce lust, anger, greed, ignorance, vanity, egotistic feelings, envy, harshness, falsehood, idleness, may all acts that soil the good name of a man..... Thou shalt help with thy professional skill and knowledge the brahmanas, elders, preceptors and friends, the indigent, the honoest, the anchorites, the helpless, the

neighbours, the strangers, thy relations and kinsmen, and Thou shalt give them medicine, and god will bless thee for that". (Sushruta Samhita 1.2.5).

As to prevent him for the misuse of his office, special emphasis was laid by the Ayurvedic treatises on the controlled relations of a physician with women. The Sushruta Text (1.10.8) forbids the physicians to speak to ladies in private or to joke with them. He was also forbidden to accept anything but cooked rice from the hands of a woman.

The prescribed dress for a practicing doctor also put the Vaidya at a pedestal equal to the saintly figures of the society. He was to put on the cloth dyed brownish yellow (ib. 1.2.5) or white (ib. 1.10.2). Even today, the fixed colours of the dress of a physician, both in oriental and occidental societies signify the nexus between religion and medicine in the age of antiquity.

Some passages in the Jatakas (Desa Brahmana Jataka, no.495) describe the physicians moving around in search of patients carrying sacks upon their backs, root-filled and fastened tight. The story of Jivaka in Mahavagga (8.1.8) also describes the famous physician walking through the streets of Saketa city saying "who is ill here? Whom shall I cure?" But the cases of physicians treating their patients in their own clinics, usually their own homes, were also not unfamiliar. The Kamasutra (5.2.6) an early Gupta book on art of love, includes the clinic of physicians among the convenient trysting places for lovers. A physician is described as having a storeroom filled with

drugs and medicinal equipments (Sushruta Samhita 1.36.17). With the aid of his assistant he produced his own drugs from herbs and other ingredients which he often collected himself. These were likely to be more efficacious than those obtained indirectly, for he could be sure that they were unadultered and were collected at auspicious times, with the utterance of the correct mantras (Zimmer 1948 : 105).

In his prescriptions the Vaidya was not bound by the usual taboos of upper-class Indians. He used animal products freely in compounding his drugs, and might recommend a meat diet in certain cases. It seems that the Vaidya enjoyed considerable independence in his treatment of the sicks and even Manu's Code (4.179) lays down that one should never have a dispute with pysicians. The ideal physician was able to instill such confidence in his patients that they trusted him as fully as they trusted their parents and kinsfolk, and cared for them as he could care for his own sons (Sushruta Samhita 1.25.44).

As per the description of the Greek ambassador, Megasthenes, the physicians in ancient India effected cures rather by regulating diet than by use of medicines. The remedies most esteemed, according to him, were ointments and plasters (McCrindle 1876 : 102). If we have to accept his statements the ancient Indian physicians were also engaged in forewarning draughts, wet weather and diseases (ib. 40). By thier knowledge of pharmacy they could also make marriages fruitful and even determine the sex of the offspring (ib. 102).

This is clear from the medical texts that the Vaidyas of early India were not a caste but rather a fraternity of men drawn from various castes and classes. That the brahmanas, the highest group in caste hierarchy did also join this profession is evidently clear from references scattered here and there. In the Rigveda (10.97.6) a healer is called 'Vipra' a term used normally for the brahmanas (ib. 10.97.22). The Jataka stories refer to brahmana physicians (Kamanita Jataka no.228; Campeyya Jataka no.506 etc.). The high position of the physician in Mauryan age is also confirmed by the fact that Megasthenes tells that they belonged to the group of Sarmanes i.e. one of the two divisons of the philosophers, the highest caste of the seven castes of India (McCrindle 1876 : 101). The fact that a large number of the brahmanas, particularly the Shakyadipi ones, are still engaged in the profession of Vaidyas in eastern India also supports our hypothesis. According to an early medieval legend contained in the Samba Purana or Sambopakhyana, the Shakyadipi brahmanas were called by king Samba of Magadha from near Iran (Lochan 81 : 690) when the latter was ailed by white leprosy. The treatment was successful and the brahmanas settled in Eastern India in the villages donated by the king. In south also, the Nambudiri brahmanas of Kerala have six divisions, one of them being the Vaidyan, a class of physicians.

The inclusion of non-brahmana castes in the practice of medicine is also testified by many references to this effect. First of all, it must be borne in mind that through the gradual fusion of the aboriginal tribes into ancient Indian caste structure, a larger number of

traditional healers had also joined the main social stream of the country. They brought with them their own folkloric practices and as a matter of fact they still continue to employ them in modern days. In Indian countryside we come across many low-born people holding on to their ancient legacy.

The numerous references to the non-brahmana students in medical treatises denoted a practical reality. The legendary physician Jivaka himself belonged to a low birth (Mahavagga 8.1). The early medieval dynasty of the Senas who ruled eastern India were original vaidyas. We must not, however, presume that the admission of non-brahmana castes into the profession of Ayurvedic vaidyas meant a lowering of social status in respect of low born practitioners. In fact such a branch of specialised learning as medicine was bound to bestow a status of honour to its pursuants.

Here and there, vaidyas have been referred to with great disrespect and hatred. Physicians are called cheats in the Manu Smriti (9.259) or there is a prescription of fine on healers treating their patients incorrectly (9.284). But apparently enough, such allusions only attest to the existence of frauds in the field. Similar is the case of various passages in the Arthashastra. This Mauryan book on polity prescribes penalties to the physicians engaged in curing a state-offender (Arthashastra 2.36.10). Besides it also advises the state to employ physicians, with a lot of lowly persons, in the espionage (ib. 4.4.3). Usually these facts could mean as a pointer to the non-brahmana level of the physicians in ancient India. But here they are to be analysed in the light of Machiavellian realism of Kautilya, the author

of the treatise who at one place prescribes capital punishment even to the brahmanas found guilty of treachery. In fact the vaidyas earned respect of kings in ancient India (Ramayana 2.100. 13; Mahabharata 2.15.90).

The Code of Manu (10.47) mentions a caste-group called 'ambashtha', believed to be descended from brahmana fathers and vaisya mothers, who were specially equipped by nature for the art of healing. In modern times we hear of the ambashthas as one of the divisions of the kayastha, a high-order class of north India, and also as a barber caste in South India. Some of the latter ambashthas are still engaged in the medical craft, but the former has no association with medicine as such. The brahmana vaidyas of Bengal are also probably called 'ambashthas.'

As is obvious from the narrative of the scholars in Alexander's train and also from the Ashtadhyayi of Panini (8.2.97) the term 'ambashtha' originally denoted a region in the northwest and also the people living over there. Their tragic defeat in braving the Macedonian adversary and the subsequent rout in the 4th century BC. perhaps prepared the background of the all-India emigration of the 'ambashthas'. It may be supposed that the Ambashthas were brahmanas originating from the region called Ambashtha. Since they plunged into medical practice for money, a vaisya motherhood was symbolically conferred on them while their brahmana fatherhood remained undisputed. Perhaps this also accounted for the special favour shown to the ambashthas by orthodox circles in ancient India as described by Basham (1976:37). We may here add that the dexeterity of Ambashthas in medical

craft was more valued since originally they had the privilege of residing in the neighbourhood of Taxila, a renowned centre for medical learning in past.

The remuneration normally mentioned being offered to the physicians in ancient India also advocates the theory of higher social status of vaidyas. The low caste traditional healers who met the need of the common people might have been accepting minor fees for their services, but the professional vaidyas used to receive handsome remunerations from their clients as revealed from the case of Jivaka who is said to own immense wealth. To some extent the costlier fee of the vaidyas was justified because unlike the traditional healers they practiced medicine on a full time basis.

The narrative of both the medical and non-medical treatises makes it evident that the service of a vaidya included both consultation and distribution of medicine. Thus it was not possible for him to continue his service without any remuneration. The medicinal herbs were collected from nearby forests or the like by physician himself. Sometimes he bought them for money from the farmers who grew them and paid tax to the state for its sale (Arthashastra 5.2.15). A portion of the income of the vaidyas, particularly those specialising in surgery, was also spent in buying essentials from market. Therefore, non-payment to a vaidya was criticised (Sama Jataka, no.540; Charaka Samhita 6.1.4;55). And we have very fewer examples of free medical attendance in ancient India like one in Kamanita Jataka (no.228). In fact, at one place even the Buddhist brothers are reported to be accepting remuneration in lieu of medicine (Satadhamma Jataka, no.179).

Payment to the physicians was made both in cash and kind as reflected also in the story of Jivaka (Mahavagga 8.1). Some of the physicians must have been busy and having running practice because we also come across such physicians who acquired rewards even from a patient who did not wish to receive treatment (Mahabharata 6.115.21; Kama Jataka, no.467). Besides the individual practitioners, there used also to be physicians in the salaried service of the state. They were both the general vaidyas (Ramayana 2.10.30) and those required specially in the battle field (i.e. surgeons and veterinary doctors) (Mahabharata 5.52.12).

An idea of the fees of vaidyas as well as of the cost of standard medical service in ancient India may be formed with the help of the Mauryan text, Arthashastra. This text, while prescribing salaries of different court-officials and government staff, fixes the annual pay of state-physician at 2,000 panas (Arthashastra 5.3.12). Thanks to the great painstaking effort by Auboyer (1965:112) we are able to know the value of panas in the Arthashastra which is described as below:

50 panas	=	average cost of maintaining one man of class society for a year
24 panas	=	price of a horse
12 panas	=	price of an ox
1 pana	=	400 lbs of grain/seven gallons of oil
½ pana	=	weekly expenditure of a workman.[1]

Thus the monetary position of state physicians was quite satisfactory. It may, however, be supposed that they excelled their unemployed colleagues in regular income. Besides the general state-physicians, there also used to be a royal physician in the court. Though he did not enjoy power and prestige at par with the royal priests (Sushruta Samhita 1.37.7), he nevertheless received great rewards. For example the royal vaidya of the Satavahanas was opulent enough to donate rich gifts (Pitalkhora Chaitya cave inscription).

As regards the question of the socio-economic status of the traditional professionals and practitioners outside the domain of classical medical system, an idea of it may be had from the conditions obtaining in case of their modern descendants. As noted above, even today many traditional curers are providing medical aid, particularly in the cases of child delivery and insanity. Normally, such service providers enjoy a poor status. They belong to such low castes as 'chamar' cobbler in eastern India; 'kusavan' - potter in Tamil Nadu, 'Mandula' - a low caste in Telugu country or 'Mahavat' - another low caste in western Uttar Pradesh (Basham 1976:38). On economic front, too, they are below average and they accept poor remuneration for their useful service.

APPENDIX - I

State and Medicine

As financier of research, as buyer of technology, as climate-setter for business, the role of the state in promoting innovation in medicine is inescapable. But viewing the function of the state in the ages of antiquity, it becomes clear that science has become a major preccupation for governments only in the post-war period. This was not untrue in the case of ancient Indian period, too.

We had occasion to note that the involvement of state in the arena of medical education was limited to occasional material support given to the students and teachers. It may likewise be said that a department of health in the modern sense finds no place in the administrative machinery (Kangle 1965:210; Dikshit 1971:29). This is also clear from the following distribution of the annual state expenditure as laid down in the Shukraniti, a later ancient book on polity:

Balam or army	-	50%
Danam or donations	-	8 1/3%
Adhikarinah or civil administration	-	8 1/3%
Atmabhaga or privy purse	-	8 1/3%
Prakritya or social service	-	8 1/3%
Reserve fund	-	16 1/3%

(Pant 1986:113)

Medicine and public sanitation probably formed a meagre part of the Prakritya expenditure.

The ghastly Divyavadana story (Ed. V.S. Agrawala:386), in which an ailing king's life is saved by killing another patient with similar symptom, is hardly typical of the prevalent norms. On the contrary it was believed that if there is a good king on the throne his subjects are bound to be rich in health. In other words the general well-being of the masses was a criterion to judge the efficiency of a ruler (Ramayana, 7.41.19). And as such we may suppose that ancient Indian state did offer attention towards the health of its subject. In fact, at one occasion, the code of Manu (8.395) prescribes that kings should be attentive to the sick.

Since the role of medicine is of all-pervasive nature, it naturally necessitated interaction of state with it. And, as we would note it presently, the management of army and its elephants and horses in particular required the involvement of a number of physician and other medical men. Besides, kings could not afford to do without physicians for the latter had to be approached for the health-need of his family and other important figures of the state. Again, the functioning of judicial or revenue machinery also needed consideration of a number of health issues. By examining these areas of interaction between state and medicine we may understand and document the role of the former in promoting and supporting medical craft and physicians.

In ancient Indian literature, we hardly come across references pertaining to the use of veterinary science to cure cows or goats, animals of domestic use. This aspect of medicine remained in the state of underdevelopment probably owing to the fact that the state machinery

was interested in applying it only to maintain the horses and elephants keeping in view their military utilities.

Besides the veterinary doctors a number of surgeons were regularly employed in the military department (Mahabharata 5.52.12; Arthshastra 10.3.47). Many of them served the army in the battlefield from rear but a big tent of physicians was also erected adjacent to the royal camp (Sushruta Samhita 1.34.12-14). Their quarters on campaign was also marked with a special flag, so that the wounded could easily get it (ib.) This was exactly similar to the system in Greek army as we learn it from Nearchos (McCrindle 1876:223). According to his statement Alexander had employed Indian physicians also considering their ability to cure the cases of snake-bite (ib.).

The major duty of the military physicians was, however, to keep the armymen, and the horses and elephants in a state of sound health both in peace and war (Arthashastra 13.4.8; 13.4.25). The diseased army naturally became vulnerable to the attack of the enemy (Mahabharata 1.139.78). On the eve of attack, physicians used to store enough medical materials (Ramayana 6.74.33). They gave soldiers tonics for vigour before their sojourn to the battlefield (ib. 4.11.38). The soldiers also used some antiseptic balm on this occasion (ib.6.69.18). The army physicians were supposed to be dexterous in extraction of arrows from the wounded bodies (Mahabharatha 6.120.55). The epics also inform us about the humanitarian medical treatment of the wounded soldiers of the defeated army by the physicians of the victorious camp (ib.12.25.8). After the close of fights, the military physicians were

engaged in removing the wound-marks of the soldiers with some chemicals (ib. 6.77.10).

The Sushruta Text (1.34.3), while narrating the functions of an army doctor, describes that common practice of the enemy was to poison the wells on the roadside or the articles of food available en route; hence it was incumbent on a physician marching with the troops to inspect, examine and purify these things. This medical book has also mentioned the application of anti-toxic drugs on the flags and drugs etc. to remove the adulteration of air produced by the army and to drive out the poison in the atmosphere. (ib. 5.6.4)

Along with their colleagues in the army, a large number of physicians were also employed to attend the royal family with its innumerable courtiers and palace entourage. They formed a part of the hierarchy under the king's personal vaidya who obviously stood very high among the palace officers (Sushruta Samhita 1.37.7). This royal physician, the raja-vaidya as he was called, accompanied the king in all his travels and we find him in the train of prince Bharata who tried to bring back his elder brother Rama from exile (Ramayana 2.83.14).

Another physician was appointed to supervise the royal kitchen (Sushruta Samhita 5.1.8). His functions had two purposes: to ensure that the king had a health-giving diet, and to detect and prevent attempts at poisoning him, which were not uncommon. Naturally this profession involved risks and unexpected illness in the royal entourage would bring him under suspicion leading often to punishment.

Besides the above physicians, the palace staff would include experts in medicine preparation or medical store in-charges because we see that there was a dispensary in the palace of Ravana (Ramayana; 5.11.23), some passages in the Mahabharata (12.39.2; 14.67.3) refer to the establishment of gynaecological clinics (Sutika-grighas) in the palace.

A major utility of the physicians was at the front of espionage for which many of them were regularly recruited (Arthashastra 4.4.3). It seems that special attention was given to keep all these state-physicians contented so that they could be attentive with their full capacity (Ramayana 2.10.30; 2.100.13). The Mauryan treatise, Arthashastra (5.13.12), fixes their salaries at 2000 panas per annum which was a quite handsome amount considering the purchase value of these coins.

As regards the involvement of the state in provision of public medicine, we fail to discover any concrete examples of it. But isolated instances are there showing state concern in this field. In Megasthenes we find the example of officers being appointed especially for looking after ailing foreigners (McCrindle 1876.42;87). A passage in the Arthashastra (2.4.14) talks of the establishment of a 'bhaishajyagriham' in the north-western quarter of the city. It might have been either a hospital or medical dispensary.

In the second pillar edict of Asoka, the emperor states that he has provided for medical treatment of men and animals. This evidence is substantiated by the discovery of an ancient seal referring to an

'arogyashala' or hospital in the ruins of the ancient Mauryan palace near modern Patna (Museum guide 1971:33). We may fairly suppose that Asoka, the sage emperor might have done much to promote the health of his people, for he also announced to have caused medicinal herbs to be cultivated where they were not grown before. This much, however, is true that, whomsoever great Asoka's ingenuity was, his such acts must have conformed to the general tradition of kingship in ancient India. His successors to the Magadhan throne might also have followed his example. But, unfortunately, we fail to discover any evidence to substantiate it. But in the 4th century AD. Ceylon we hear of impressive public medical service provided by the Buddhist king, Buddhaghosha. The later Buddhist sources like Chullavamsa speak of establishment by him of a 'hall of physicians' and mention provision of a resident physician for every ten villages. The pious king probably also maintained asylums for the crippled and blind.

In the mainland of the sub-continent, we find the 5th century AD. Chinese pilgrim, Fa-hsien, describing such hospitals staffed by physicians where the indigents and sicks got free services. But, according to his report, such humanitarian efforts were financed by the opulent private benefactors and not by the state. On the other hand, there were kings like the 7th century AD. northern Indian ruler Harsha, who, as per the record of his contemporary Chinese pilgrim Hsuan Tsang, erected rest-houses along the high ways with the provision of physicians and medicine to attend travellers and poors with no money. However, none of the Northern Indian rulers could excel the early medieval Chola kings of South in making sustained efforts for providing medical care for their subjects.

The ancient government's interest in the health of the people was probably inspired by the brahmanical social ethics enjoining the duty of protecting people upon the kshatriyas, i.e. ruling class. From the testimony of the Charaka Samhita (1.30.29) also, we learn that pupils of this class studied medicine for the purpose of protection (arakshartham). From the Mauryan treatise, Arthashastra (4.3.13), also we come to know that tackling the problems of epidemics drew considerable attention of the rulers. According to this work on polity, epidemics were included among the eight major threats to the state (ib.4.3.1). One may interpret this reference to postulate that public upsurge broke out in case the state failed to deal epidemics sympathetically as well as successfully.

The state was interested in public medicine in more than one ways. According to the Sushruta Samhita (1.10.2), obtaining a licence was an essential prerequisite for entering into medical practice. The Charaka Samhita (1.29.8) ascribes the existence of imposters among vaidyas to the corruption in the state machinery. To check such 'messengers of death on earth' Sushruta (1.3.49) suggests even capital punishment for them.

Even the regular physicians could be taken to task if found guilty of extending medical aid to the state-offenders (Arthashastra 2.36.10; Charaka Samhita 6.13.176). Violation of this restriction could attract penalty, too (Arthashastra 4.1.56). Treating patients inaccurately was another type of cases attracting state ire (Manu Smriti 9.284). We are, however, yet to discover any Indian parallel to the penalty of chopping off hands of the unsuccessful doctors as laid down in the Hammurabi Code, the oldest surviving inscription of the world of antiquity.

The Arthashastra as well as the Code of Manu provide instances attesting to the state's concern for public health. This is amply illustrated by the fiscal instructions contained in the Arthashastra. It prescribes fines for selling rotten flesh (2.27.5) or selling adulterated medicine, oil, salt or similar items (4.2.22). The state treasury was enriched also by the tax on cultivation of medicinal herbs (Arthashastra 4.11.6), which was fixed at 1/6th of the produce (Manu Smriti 7.131). The Kautilyan treatise frees from toll the articles meant for aid in delivery cases (2.21.18). Special concession was also extended to the pregnant women so as they could travel in boats without any payment (ib. 2.28.18; Manu Smriti 8.407). The state was not keen on collecting debts from the sick (Arthashastra 3.11.13). The Arthashastra has also referred to the general concessions for the diseased subjects at number of occasions (3.20.22; 5.3.29).

The judicial administration as described in the Arthashastra (2.36.28) also reflects state concern for public hygiene etc. It prescribes fines for throwing dirt on public roads. Manu also criticises such nuisance severely (Manu Smriti 4.56). Both these treatises, which immensely influenced the functioning of state in ancient India, are unanimous in barring the diseased from offering witness in judicial courts (Arthashastra 3.11.29; Manu Smriti 8.64).

Besides, the physicians were included among a handful of persons who were allowed to out in the night (Arthashastra 2.36.44). The state had a lenient approach to the ailing prisoners. According to Kautilya,

those healthy persons pretending to be suffering from disease were to be arrested without hesitation (ib. 2.28.30), while those really ill were released even when imprisoned (ib. 2.36.44).

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ABBREVIATION USED:

AIIMSL.	-	All India Institute of Medical Sciences-Library, Delhi.
BHM	-	Bulletin of the History of Medicine, Baltimore.
BIHM	-	Bulletin of the Institute of History of Medicine, Hyderabad.
CSL.	-	Central Secretariat Library, Delhi.
CUP.	-	Cambridge University Press
DUL.	-	Delhi University Central Library, Delhi.
Hy.	-	History
IJHM	-	Indian Journal of History of Medicine, Madras.
IJHS	-	Indian Journal of History of Sciences, Delhi.
IMSL.	-	Institute of Medical Science Library, BHU, Varanasi.
INSA.	-	Indian National Science Academy.
INSAL.	-	Indian National Science Academy Library.
JHM & AS	-	Journal of History of Medicine and Allied Sciences, Connecticut.
JNUL.	-	Central Library and CSMCH Seminar Library, Jawaharlal Nehru University, Delhi.
JRA & S	-	Journal of Research in Ayurveda and Siddha, Delhi.
JRIM	-	Journal of Research in Indian Medicine, Varanasi.
MB.	-	Motilal Banarasidas Book Publishers.
Med.	-	Medicine.
MH	-	Medical History (Periodical), London.
MM.	-	Munshiram Manoharlal Book Publishers.

NCERT.	-	National Council of Educational Research and Training, Delhi.
NMedL.	-	National Medical Library, Delhi.
NMul.	-	National Museum Library, Delhi.
OUP.	-	Oxford University Press.
PIHC.	-	Proceedings of Indian History Congress.
RP.	-	Reprint
SA	-	Sachitra Ayurveda (Periodical), Calcutta.
SHP.	-	Shree Hari Pustakalaya, Patna.
SinhaL.	-	Sinha Library, Patna.
TML.	-	Teen Murti Library, Delhi.
U.	-	University.
UCP.	-	University of California Press.

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